Fred Rose & Jerry Pavese Park
Shoreline Stabilization Design Report

(Lake George)

City of Hobart
LAKE COUNTY, INDIANA

December 10, 2004

Prepared by:

JFNew

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City of Hobart
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1.0 PROJECT DESCRIPTION AND PURPOSE

Fred Rose and Jerry Pavese Parks are located along the shore of Lake George in Hobart, Indiana (Figure 1). The parks are located across the lake from one another just east of the Wisconsin Street Bridge and southwest of downtown Hobart. Jerry Pavese Park lies on the northern shoreline and Fred Rose Park on the southern shoreline of Lake George (Figure 2). The City of Hobart's Parks and Recreation Department manages each of the parks. Both Fred Rose Park and Jerry Pavese Park offer a number of outdoor recreational opportunities including fishing, basketball, and picnicking to the residents of Hobart and surrounding Lake County communities. Additionally, both parks support oak savannah habitat along the top of their steep banks.

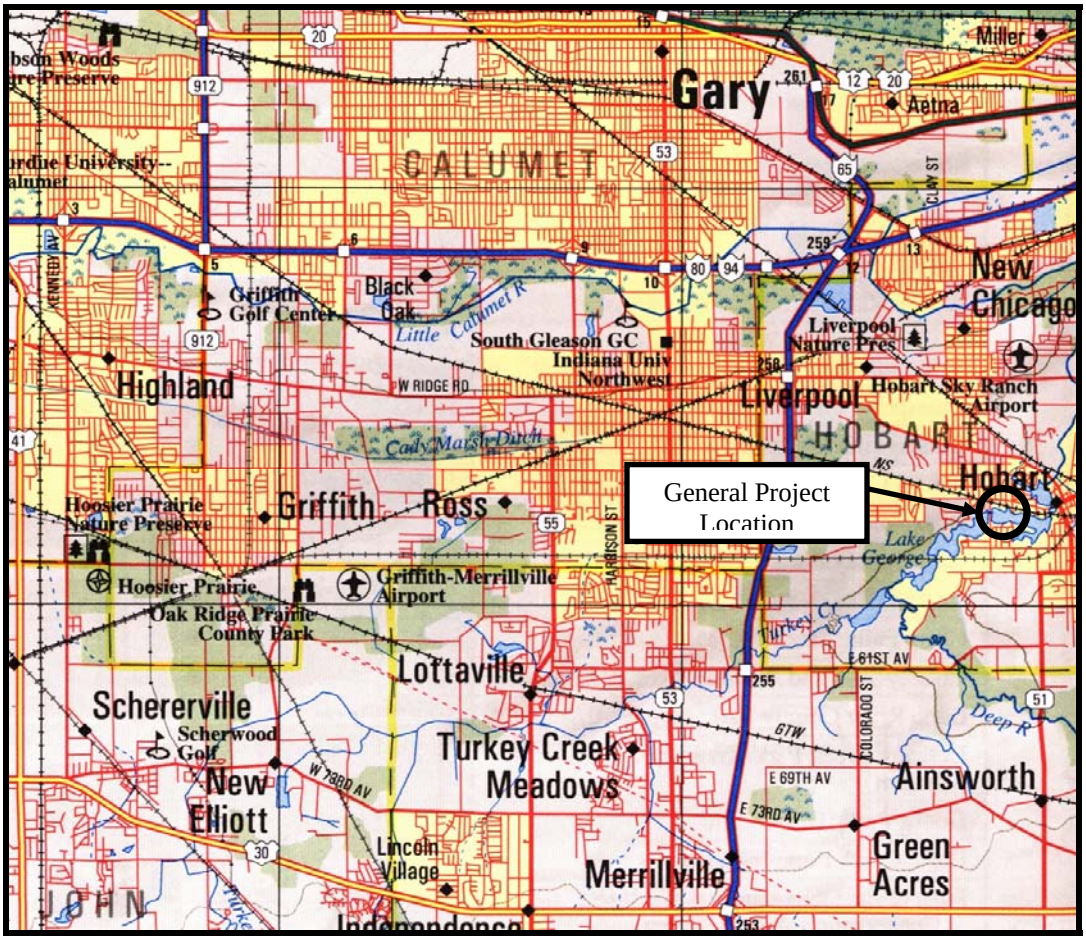


Figure 1. Fred Rose & Jerry Pavese Parks general project location.

Both Fred Rose and Jerry Pavese Parks have areas of significant erosion along their respective shorelines. This erosion can be attributed to fluctuating water levels, wave action, and pedestrian traffic. Lake George's water level can fluctuate widely after significant precipitation events

within its watershed. It is not uncommon for Lake George's water level to rise more than three feet following sustained heavy rain events. One of the most recent examples of this occurred between June 11 and June 14, 2004 when the USGS gage on the Deep River at the Lake George outlet recorded a nearly 4-foot increase in lake water level. The water level fluctuation and wave action cause the expansion, contraction, and collapse of the soil structure at the base of the slopes along the two parks. Once these processes have undermined the slopes, the top of the banks collapse into the water, and the erosion process repeats itself on the newly exposed banks.

Figure 2. Aerial view of project area.

2.0 DESIGN RATIONALE

The design chosen for this project reflects the desire to stabilize the shoreline with low maintenance vegetation while minimizing disturbance to the existing oak savannah habitat. Several existing access paths to the shoreline will also be stabilized. Three different treatment methodologies (Treatment A, B, and C) were chosen based on the various stages of erosion present along the shoreline. Treatment A consists the installation of coconut fiber logs (coir logs) along existing shoreline areas that have moderate slopes leading to the water's edge and possess slight to moderate shoreline erosion. Treatment B involves reconstructing the shoreline slopes by placing clean earthen fill on top of a rock base that extends 4 to 12 feet out into Lake George. Treatment C provides a stone path and ledge for the continued use of existing public access

points to the water. Each of these treatment types eliminates the need to pull back the existing slopes, thereby preventing the removal of mature trees and minimizing disturbance of the existing oak savannah habitat bordering the lake.

3.0 DESIGN AND CONSTRUCTION SPECIFICS

3.1 Permitting

A Lake Preservation Permit is required from the Indiana Department of Natural Resources (IDNR) to complete the proposed work because fill will be placed "lakeward of the lake's legal or average shoreline". Clean Water Act Section 401 Water Quality Certification from the Indiana Department of Environmental Management (IDEM) and a Section 404 permit from the U.S. Army Corps of Engineers (USACOE) are required because Lake George is considered a "water of the United States". The IDNR, IDEM, and USACOE permits authorizing the construction of the shoreline stabilization measures along Jerry Pavese Park and Scout Cabin shorelines are included in Appendix A. Permits for Fred Rose Park will be obtained in the second phase of this project.

3.2 Landowner Agreements

The proposed bank stabilization work area is located entirely within the boundaries of two City of Hobart parks, Fred Rose and Jerry Pavese. The City of Hobart is the sponsor of the project and will continue to own and maintain the parks indefinitely. No agreement is necessary to conduct the project or to complete any follow-up maintenance.

3.3 Treatment A

Shoreline areas with moderate gradients leading to the water's edge and slight to moderate shoreline erosion will be stabilized with 16 or 20-inch diameter, 9-pound density, pre-planted coir logs. Installation of this treatment will occur along 720 lineal feet of shoreline at Jerry Pavese Park and along 720 lineal feet of shoreline at Fred Rose Park. The coir logs will be pre-planted with native plant species plugs three months before installation. This will affect scheduling and timing of the construction. The coir logs will be placed in the water following the contour of the existing shoreline. The coir logs will be held in place with driven wooden stakes placed on 1.5-foot centers. Nylon rope will be woven between stakes and over the logs to hold them in place. Voids between the coir log and shoreline will be filled with clean earthen fill to match the existing upland grade. The earthen fill will be planted with a native seed mix. Species to be included in the seed mix are listed in the design plans (Appendix B) and in the Special Provisions (Appendix C). After seeding, the filled slope will be blanketed with a turf reinforcement mat (TRM) and stapled in place following the manufacturer's recommendations. Once the vegetation matures, the native plantings will secure the soils, including the immediate shoreline, with their root mass. The coir log is expected to last from 5 to 7 years before decomposing and leaving a fully vegetated shoreline. The TRM has biodegradable coconut fibers encased within permanent synthetic mesh. The permanent mesh is expected to last 50 years or more and serve to protect the base of the planted vegetation from being trampled or eroded. Treatment A details are included in the Plans and Special Provisions (Appendix B and C).

3.4 Treatment B

The proposed areas for Treatment B include embankment heights that range from 3 to 11 feet within Jerry Pavese and Fred Rose Parks. Treatment B is proposed along 1,175 lineal feet of Jerry Pavese Park shoreline and 1,370 lineal feet of Fred Rose Park shoreline. The following describes the construction sequence for stabilizing these steep slopes. A rock foundation will extend approximately 4 to 12 feet lakeward of the shoreline to provide a stable base to reconstruct the existing slope. (The distance of rock lakeward of the shoreline is determined by the height of the existing cut slope. The higher the embankment, the further lakeward the base must be placed in order to create a 1.5:1 (horizontal: vertical) slope.) The rock will be installed at the toe-of-slope to a height of 3-feet above the lake bottom elevation. A non-woven geotextile fabric (filter cloth) will be placed between the rock and the lake bottom as well as between the rock and embankment fill above to prevent soil from being washed out through the rock by wave action or water level changes. Clean earthen fill will be placed on top of the rock base and regraded to match the existing upland slope. Geosynthetic soil reinforcement (geogrid) will be placed every two vertical feet within the reconstructed slope to prevent mass slope failure. Native shrubs will be placed at the junction of the fill and the rock to add long-term root strength to this junction. Native herbaceous plant species will be seeded onto the filled slope prior to the application of TRM and erosion control blankets (ECB). The TRM will be used for long-term protection of the reconstructed slope surface within the zone of annual water fluctuation. The intent of the native plantings is to secure the reconstructed slope with vegetative root mass upon maturity. The portion of the filled or disturbed slope above the TRM will be blanketed with a straw-coconut ECB. Treatment B details, including plant species lists, are attached in the Plans and Special Provisions (Appendix B and C).

3.5 Treatment C

Treatment C is intended to allow for continued shoreline access in areas already utilized by park visitors. Existing footpaths to the water's edge are eroding from general foot traffic as well as overland flow. The paths are currently unvegetated and possess rill and gully erosion that carries sediment directly to the lake. Proposed footpaths to the shoreline will follow existing footpaths. Three locations within Jerry Pavese Park and two locations within Fred Rose Park have been chosen for Treatment C installation. These lakeshore footpaths will be regraded to a gently sloping surface. Gravel will be installed along the length of the existing footpaths from the rock base at the water's edge up to the top of the bank to prevent further erosion by overland flow. A rock shelf will be constructed at the water's edge to allow for access directly to the water. The rock shelf will eliminate erosion potential. A 2.5-foot layer of revetment riprap will be installed over a non-woven geotextile fabric to form the base of the rock shelf. Two-inch layers of #2 stone and then small, unwashed gravel (#53 stone) will be added over the revetment riprap to form a smooth walking surface. This walking surface will be approximately 1-foot above normal water levels but will be subject to frequent inundation. Treatment C will be constructed to blend in with Treatment A and B methodology. Treatment C details, including plant species lists, are located in the Plans and Special Provisions (Appendix B and C).

3.6 Boat Launch and Pier

A boat launch that currently exists at Jerry Pavese Park will be replaced with a concrete launch pad and pier structure. The boat launch and pier are being designed by others as part of a separate park improvement project and are not included in this report.

4.0 OPINION OF PROBABLE COST

The opinions of probable cost for shoreline stabilization at Jerry Pavese and Fred Rose Parks are $198,083 and $467,753, respectively. Tables 1 and 2 reflect unit costs for Jerry Pavese (Table 1) and Fred Rose (Table 2) Parks by treatment type. Tables 3 and 4 detail the cost breakdown for items within each treatment type by park. Engineering oversight has been purposely omitted from these cost estimates due to the unknown nature of how the project will be bid out for construction and whether a private engineering firm or the city's engineer will oversee construction. If a private firm is utilized, the city should assume that an additional 10 to15% of the total construction fee for each park is required for construction supervision and management.

Table 1. Probable cost estimate for shoreline stabilization at Jerry Pavese Park.

Item	Unit	Unit Cost	Number of Units	Total
Treatment A	Lineal feet	$65	720	$46,800
Treatment B	Lineal feet	$107	1,175	$125,775
Treatment C	Each	$2,500	3	$7,500
Subtotal				**$180,075**
Contingency	--	--	10%	$18,008
Total				**$198,083**

Table 2. Probable cost estimate for shoreline stabilization at Fred Rose Park.

Item	Unit	Unit Cost	Number of Units	Total
Treatment A	Lineal feet	$65	720	$46,800
Treatment B	Lineal feet	$107	3,490	$373,430
Treatment C	Each	$2,500	2	$5,000
Subtotal				**$425,230**
Contingency	--	--	10%	$42,523
Total				**$467,753**

Table 3. Worksheet estimates for individual work items within Treatment Types for Pavese Park. Estimates include acquisition of materials, incidentals, and installation.

Item	Unit	Unit Cost	Number of Units	Total
Pre-planted coir log	Lineal foot	$50.00	720	$36,000
Seeding	Acre	$2,500.00	1.0	$2,500
TRM	Sq. yard	$4.50	1500	$6,750
ECB	Sq. yard	$3.45	1500	$5,175
Stone	Ton	$35.00	1100	$38,500
Filter cloth	Sq. yard	$1.50	2000	$3,000
Shrubs	Each	$3.00	650	$1,950
Embankment fill	Cubic yard	$30.00	2500	$75,000
Geogrid	Sq. yard	$7.00	1600	$11,200
Total				**$180,075**

Table 4. Worksheet estimates for individual work items within Treatment Types for Fred Rose Park. Estimates include acquisition of materials, incidentals, and installation.

Item	Unit	Unit Cost	Number of Units	Total
Pre-planted coir log	Lineal feet	$50.00	720	$36,000
Seeding	Acre	$2,500.00	2.0	$5,000
TRM	Sq. yard	$4.50	3300	$14,850
ECB	Sq. yard	$3.25	5500	$17,875
Stone	Ton	$35.00	2800	$98,000
Filter cloth	Sq. yard	$1.50	9000	$13,500
Shrubs	Each	$3.00	1500	$4,500
Embankment fill	Cubic yard	$30.00	6000	$180,000
Geogrid	Sq. yard	$7.00	7930	$55,510
Total				**$425,235**

5.0 BIDDING REQUIREMENTS

An invitation to bidders for the Jerry Pavese Park work will be issued as part of a larger bid to restore the entire park. It is expected that the bid process will conform to City of Hobart bonding and bidding practices. The invitation will include the project design drawings, general specifications, and the special provisions contained in this document (Appendix C). Design specifics, access to the project site, and any proposed design modification or potential construction issues should be discussed with the engineering consultant or design engineer prior to bid submittal. The Fred Rose Park work will be bid under a separate bid package as funds become available. It is expected that the Jerry Pavese Park project will proceed to construction in the spring of 2005, while the Fred Rose Park work would begin late in the summer of 2005.

6.0 SPECIFICATIONS

The specifications for this project are included in Appendix C as Special Provisions. They are written as Special Provisions because they will be used within a larger set of standard specifications to complete the work at Jerry Pavese Park. There are eight Special Provisions including ones for General Information, Clearing and Grubbing, Rock Toe Protection, Embankment Construction, Seed Mixture, Shrubs, Erosion Control Blankets, and Coconut Fiber Logs. An additional set of Standard Specifications will be issued in Phase II of this project to facilitate the Fred Rose Park bids.

7.0 CONSTRUCTION SCHEDULE

Construction within Jerry Pavese Park is anticipated to begin in the spring of 2005 and be completed by the summer of 2005. Construction within Fred Rose Park is anticipated to begin during the summer of 2005 after funding has been secured. Final construction schedules will be dependent upon funding and permit acquisition.

8.0 MONITORING AND MAINTENANCE SCHEDULE

Seasonal monitoring of the site is recommended. The City of Hobart's Parks and Recreation Department should monitor the project site as part of their park maintenance duties. The individuals conducting the monitoring should note any areas of shoreline stabilization or native planting failure within the construction limits. Shoreline stabilization failures include torn or displaced erosion control blankets or turf reinforcement mats, coconut fiber log displacement, gully formation under the erosion control blankets or turf reinforcement mat, and bank sloughing. Native planting failure includes: bare areas of more than 3 square feet after the first 4 weeks of the growing season following installation, less than 75% survival of shrubs, or less than 50% of the native species seeded during project installation after two full growing seasons. Failures should be reported to JFNew so that remedial actions can be taken. Example monitoring forms can be found in Appendix D.

Invasive species such as honeysuckle, sweet clover, Canada thistle, purple loosestrife, Eurasian water milfoil, and others are likely to be present on the site. Any herbicide application deemed necessary should be applied directly to the target plant species via a backpack sprayer or similar device. Maintenance crews should not mow or indiscriminately apply herbicides to the treatment areas to control invasive species, as the native species will likely be damaged at the same time. Prescribed burns should not be conducted along slopes that have been blanketed with the ECB's or TRM's for at least four years. Failure to do so may compromise bank stability by destroying the erosion control blanket or turf reinforcement mat. Rock may occasionally need to be replaced at the shore access areas. If rock does need to be replaced, it should be delivered to the access area by wheelbarrow or utility cart and hand applied to prevent damage to the turf reinforcement mat.

9.0 PROJECT SUMMARY

The project as designed will stabilize the eroding shorelines at Fred Rose and Jerry Pavese Parks with bioengineering technology, while protecting the oak savannah habitat currently present within each of the parks. The embankments will be stabilized at the toe-of-slope in most areas with rock, and all cut banks will be filled and planted with native species. In addition, this project will stabilize the eroding footpaths and allow continued lake access at several locations within each park. A total of 1,985 feet of shoreline in Jerry Pavese Park and 4,270 feet of shoreline in Fred Rose Park are proposed for stabilization. Construction costs are estimated to be $198,000 at Jerry Pavese Park and $467,753 at Fred Rose Park. Jerry Pavese Park construction is anticipated to begin during the spring of 2005 and Fred Rose Park construction is anticipated to begin late in the summer of 2005.

APPENDIX A

PERMITS

FRED ROSE & JERRY PAVESE PARK
SHORELINE STABILIZATION DESIGN REPORT

LAKE COUNTY, INDIANA

DEPARTMENT OF THE ARMY
DETROIT DISTRICT, CORPS OF ENGINEERS
REGULATORY OFFICE
SOUTH BEND FIELD OFFICE
2422 VIRIDIAN DRIVE SUITE # 101
SOUTH BEND, INDIANA 46628

August 16, 2004

IN REPLY REFER TO

File No. 04-145-022-0

Mike Farrell
City of Hobart Parks & Recreation Department
111 E. Old Ridge Road
Hobart, Indiana 46342

Dear Mr. Farrell:

Reference your application for a Department of the Army permit to discharge fill for a bank stablization project in wetlands adjacent to and in Lake George at Pavese Park in Hobart, Indiana (Township 36N, Range 7W, Section 31, Lake County).

We have verified that the project is authorized by Nationwide Permit 3 as published in the Federal Register and Under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act and under the Indiana Regional General Permit 99-100-003-0 issued by Louisville and Detroit Districts on Feb 11, 2000 for certain activities having minimal impact in Indiana. You may proceed with the work subject to the enclosed general conditions, the noted special conditions, and Indiana Department of Environmental Management (IDEM) Section 401 Water Quality Certification.

As indicated on the enclosed plans, the following work is authorized:

Four types of shoreline protection are to be installed along 2115 linear feet of the Jerry Pavese Park on Lake George to stablize the banks, reduce erosion and replace/repair an existing boat ramp. The following four types of protection will vary along the shoreline.

- The first type of shoreline proection will include 720 linear feet of bio-engineering which involves the installation of fiber logs waterward of the Ordinary High Water Mark of the Lake. These fiber logs will be plugged with herbacious vegetation and woody vegetation (live stakes).

- The second shoreline protection is the discharge of fill material along 1310 linear feet of the shoreline, and will involve the discharge of approximately 728 cubic yards of clean fill. The amount of fill material and riprap discharge will vary along the shoreline depending on the existing slope, but will not exceed 11' waterward of the OHWM and will average approximately 5' within the area where this shoreline line protection method

is installed.

- The third method will invlove the repair/replacement of an existing boat ramp. This will include the discharge up to 10 cubic yards of concrete into a 20' x 31' area waterward of the Ordinary High Water Mark for repair/replacement of the existing boat ramp.

- The fourth method will be development and revetment of public access locations. This will include the disharge of a total of 40 cubic yards of material, 13.3 cubic yards at each of the three locations.

Approximately 85 linear feet of the 2115 shoreline area will receive no additional protection. All work is to be completed as indicated on the attached plans.

This authorization is contingent upon compliance with the following terms and conditions:

a. The enclosed nationwide permit(s), nationwide general conditions, and the regional permit conditions.

b. The following special conditions:

1. The permittee shall adhere to the conditions specified by the Section 401 Water Quality Certification issued by the Indiana Department of Environmental Management (attached).

2. If any archaeological or human remains are uncovered during construction, demolition or earthmoving activities, the permittee must stop work and immediately notify the District Engineer, and within two (2) days notify the Indiana Department of Natural Resources Division of Historic Preservation and Archaeology.

3. You must place all excavated material associated with any portion of this project, including upland excavation activities, outside of any water of the United States including wetlands in a manner to insure no return to any waterway or wetland. You acknowledge that this material and its ultimate disposition is your responsibility regardless of who transports the material.

4. This permit does not authorize the discharges of dredged or fill material, including sidecasting, preliminary grading or incidental movement of soils, for access or haul roads, or to construct storing or staging areas or pads into any water of the United States including wetlands. No temporary or permanent discharges of dredged or fill material into wetlands or other waters of the United States other than that shown on the attached plans, shall not commence without prior written authorization from this office.

5. The disposal or chipping of trees, brush, and other debris in any stream corridor, wetland, or surface water is prohibited.

6. Physical disturbance of banks, submerged vegetation and riparian vegetation, especially large trees which provide shade to the waterbody, should be limited to that which is absolutely necessary to the conduct of the project.

7. Measures must be adopted to prevent potential pollutants from entering the watercourse. Construction materials and debris, including fuels, oil, and other liquid substances, will not be stored in the construction area in a manner that would allow them to enter the watercourse as a result of spillage, natural runoff, or flooding.

8. Deposition of dredged or excavated materials and all earthwork operations will be carried out in such a manner that soil erosion and sediment runoff to any nearby watercourse are controlled and minimized. The use of straw bale barriers, silt fencing, or an earthen berm around disturbed areas is recommended to prevent soil from leaving the construction site.

Any construction activity other than that shown on the plans may not qualify for the authorization. If that is not the case, you must contact this office for further instructions. If you contemplate any changes or additional activities from those depicted on the plans, please submit them to this office for authorization review prior to any construction. Upon completion of the work, fill in and return the enclosed COMPLETION REPORT.

This verification is invalid until all appropriate state permits/certifications or waivers thereof have been obtained. We suggest that you contact the Indiana Department of Natural Resources in Indianapolis, Indiana at 317-232-4163 prior to commencement of work. We also recommend that you contact the appropriate local government body to determine if approval is required. In addition, you are required to informally consult with the U.S. Fish and Wildlife Service, 620 South Walker Street, Bloomington, Indiana 47403-2121 or telephone 812-334-4261 to determine if your work may affect a Federally listed endangered or threatened species.

This verification is valid for 2 years from the date of this letter unless the Nationwide or Regional Permit is modified, suspended, or revoked. If you have any questions on this matter, contact me at (574) 232-1952 and refer to File Number: 04-145-022-0.

Sincerely,

ORIGINAL SIGNED BY

John C. Ritchey
Project Manager
South Bend Field Office

Enclosures

Copy Furnished

Indiana Department of Natural Resources, w/encl.
Indiana Department of Environmental Management (Maupin), w/encl.
J.F. New and Associates, Inc. (Richardson), w/encl.

Nationwide Permit General Conditions

The following general conditions must be followed in order for any authorization by an NWP to be valid:

1. Navigation. No activity may cause more than a minimal adverse effect on navigation.

2. Proper Maintenance. Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.

3. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date.

4. Aquatic Life Movements. No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

5. Equipment. Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.

6. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions which may have been added by the division engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the State or tribe in its Section 401 water quality certification and Coastal Zone Management Act consistency determination.

7. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a ``study river'' for possible inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

8. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

9. Water Quality. (a) In certain States and tribal lands an individual 401 water quality certification must be obtained or waived (See 33 CFR 330.4(c)).

(b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the State or tribal 401 certification (either generically or individually) does not require or approve a water quality management plan, the permittee must include design criteria and techniques that will ensure that the authorized work does not result in more than minimal degradation of water quality. An important component of a water quality management plan includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality. Refer to General Condition 21 for stormwater management requirements. Another important component of a water quality management plan is the establishment and maintenance of vegetated buffers next to open waters, including streams. Refer to General Condition 19 for vegetated buffer requirements for the NWPs.

10. Coastal Zone Management. In certain states, an individual state coastal zone management consistency concurrence must be obtained or waived (see Section 330.4(d)).

11. Endangered Species. (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. For activities that may affect Federally-listed endangered or threatened species or designated critical habitat, the notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. As a result of formal or informal consultation with the FWS or NMFS, the District Engineer may add species-specific regional endangered species conditions to the NWPs.

(b) Authorization of an activity by a nationwide permit does not authorize the ``take'' of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with ``incidental take'' provisions, etc.) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal ``takes'' of protected species are in violation of the Endangered Species Act. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. Fish and Wildlife Service and National Marine Fisheries Service or their world wide web pages at http://www.fws.gov/r9endspp/endspp.html and http://www.nfms.gov/prot_res/esahome.html, respectively.

12. Historic Properties. No activity which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the DE has complied with the provisions of 33 CFR part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)). For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the notification must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

13. Notification. (a) Timing: Where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a preconstruction notification (PCN) as early as possible. The District Engineer must determine if the PCN is complete within 30 days of the date of receipt and can request the additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the District Engineer will notify the prospective permittee that the

PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the District Engineer. The prospective permittee shall not begin the activity:

(1) Until notified in writing by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division Engineer; or

(2) If notified in writing by the District or Division Engineer that an individual permit is required; or

(3) Unless 45 days have passed from the District Engineer's receipt of the complete notification and the prospective permittee has not received written notice from the District or Division Engineer. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Notification: The notification must be in writing and include the following information:

(1) Name, address, and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or
individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity; and

(4) For NWPs 7, 12, 14, 18, 21, 34, 38, 39, 40, 41, 42, and 43, the PCN must also include a delineation of affected special aquatic sites, including wetlands, vegetated shallows (e.g., submerged aquatic vegetation, seagrass beds), and riffle and pool complexes (see paragraph 13(f));

(5) For NWP 7, Outfall Structures and Maintenance, the PCN must include information regarding the original design capacities and configurations of those areas of the facility where maintenance dredging or excavation is proposed.

(6) For NWP 14, Linear Transportation Crossings, the PCN must include a compensatory mitigation proposal to offset permanent losses of waters of the United States and a statement describing how temporary losses of waters of the United States will be minimized to the maximum extent practicable.

(7) For NWP 21, Surface Coal Mining Activities, the PCN must include an Office of Surface Mining (OSM) or state-approved mitigation plan.

(8) For NWP 27, Stream and Wetland Restoration, the PCN must include documentation of the prior condition of the site that will be reverted by the permittee.

(9) For NWP 29, Single-Family Housing, the PCN must also include:

(i) Any past use of this NWP by the individual permittee and/or the permittee's spouse;

(ii) A statement that the single-family housing activity is for a personal residence of the permittee;

(iii) A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring 1/4 acre or less will not require a formal on-site
delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than 1/4 acre in size, a formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f));

(iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(10) For NWP 31, Maintenance of Existing Flood Control Projects, the prospective permittee must either notify the District Engineer with a PCN prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the
following:

(i) Sufficient baseline information so as to identify the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site.

(11) For NWP 33, Temporary Construction, Access, and Dewatering, the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources.

(12) For NWPs 39, 43, and 44, the PCN must also include a written statement to the District Engineer explaining how avoidance and minimization of losses of waters of the United States were achieved on the project site.

(13) For NWP 39, Residential, Commercial, and Institutional Developments, and NWP 42, Recreational Facilities, the PCN must include a compensatory mitigation proposal that offsets unavoidable losses of waters of the United States or justification explaining why compensatory mitigation should not be required.

(14) For NWP 40, Agricultural Activities, the PCN must include a compensatory mitigation proposal to offset losses of waters of the United States.

(15) For NWP 43, Stormwater Management Facilities, the PCN must include, for the construction of new stormwater management facilities, a maintenance plan (in accordance with State and local requirements, if applicable) and a compensatory mitigation proposal to offset losses of waters of the United States.

(16) For NWP 44, Mining Activities, the PCN must include a description of all waters of the United States adversely affected by the project, a description of measures taken to minimize adverse effects to waters of the United States, a description of measures taken to comply with the criteria of the NWP, and a reclamation plan (for aggregate mining activities in isolated waters and non-tidal wetlands adjacent to headwaters and any hard rock/mineral mining activities).

(17) For activities that may adversely affect Federally-listed endangered or threatened species, the PCN must include the name(s) of those endangered or threatened species that may be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work.

(18) For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

(19) For NWPs 12 and 14 where the proposed work involves discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within 100-year floodplains (as identified on FEMA's Flood Insurance Rate Maps or FEMA-approved local floodplain maps), and for NWPs 29, 39, 40, 42, 43, and 44, where the proposed work involves discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the flood fringe of 100-year floodplains of headwater streams, the notification must include documentation demonstrating that the proposed work complies with the appropriate FEMA or FEMA-approved local floodplain construction requirements.

(c) Form of Notification: The standard individual permit

application form (Form ENG 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(19) of General Condition 13. A letter containing the requisite information may also be used.

(d) District Engineer's Decision: In reviewing the PCN for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. The prospective permittee may, optionally, submit a proposed mitigation plan with the PCN to expedite the process and the District Engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, the District Engineer will notify the permittee and include any conditions the District Engineer deems necessary.

Any compensatory mitigation proposal must be approved by the District Engineer prior to commencing work. If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the District Engineer will expeditiously review the proposed compensatory mitigation plan. The District Engineer must review the plan within 45 days of receiving a complete PCN and determine whether the conceptual or specific proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant stating that the project can proceed under the terms and conditions of the nationwide permit.

If the District Engineer determines that the adverse effects of the proposed work are more than minimal, then he will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the District Engineer determines that mitigation is required in order to ensure no more than minimal adverse effects on the aquatic environment, the activity will be authorized within the 45-day PCN period, including the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level. When conceptual mitigation is included, or a mitigation plan is required under item (2) above, no work in waters of the United States will occur until the District Engineer has approved a specific mitigation plan.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and State agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse effects on the aquatic environment to a minimal level.

For activities requiring notification to the District Engineer that result in the loss of greater than 1/2 acre of waters of the United States, the District Engineer will, upon receipt of a notification, provide immediately (e.g., via facsimile transmission, overnight mail, or other expeditious manner), a copy to the appropriate offices of the Fish and Wildlife Service, State natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the National Marine Fisheries Service. With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 15 calendar days before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. As required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, the District Engineer will provide a response to National Marine Fisheries Service within 30 days of receipt of any Essential Fish Habitat conservation recommendations. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

(f) Wetlands Delineations: Wetland delineations must be prepared in accordance with the current method required by the Corps. For NWP 29 see paragraph (b)(9)(iii) for parcels less than 1/4 acre in size. The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 45-day period will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate.

14. Compliance Certification. Every permittee who has received a Nationwide permit verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter. The certification will include: (a) A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions; (b) A statement that any required mitigation was completed in accordance with the permit conditions; and (c) The signature of the permittee certifying the completion of the work and mitigation.

15. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3 acre.

16. Water Supply Intakes. No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may occur in the proximity of a public water supply intake except where the activity is for repair of the public water supply intake structures or adjacent bank stabilization.

17. Shellfish Beds. No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4.

18. Suitable Material. No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may consist of unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.) and material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean

Water Act).

19. Mitigation. The project must be designed and constructed to avoid and minimize adverse effects to waters of the United States to the maximum extent practicable at the project site (i.e., on site). Mitigation will be required when necessary to ensure that the adverse effects to the aquatic environment are minimal. The District Engineer will consider the factors discussed below when determining the acceptability of appropriate and practicable mitigation necessary to offset adverse effects on the aquatic environment that are more than minimal.

(a) Compensatory mitigation at a minimum 1:1 ratio will be required for all wetland impacts requiring a PCN. Consistent with National policy, the District Engineer will establish a preference for restoration of wetlands to meet the minimum compensatory mitigation ratio, with preservation used only in exceptional circumstances.

(b) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed;

(c) The District Engineer will require restoration, creation, enhancement, or preservation of other aquatic resources in order to offset the authorized impacts to the extent necessary to ensure that the adverse effects on the aquatic environment are minimal. An important element of any compensatory mitigation plan for projects in or near streams or other open waters is the establishment and maintenance, to the maximum extent practicable, of vegetated buffers next to open waters on the project site. The vegetated buffer should consist of native species. The District Engineer will determine the appropriate width of the vegetated buffer and in which cases it will be required. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineer may require wider vegetated buffers to address documented water quality concerns. If there are open waters on the project site and the District Engineer requires compensatory mitigation for wetland impacts to ensure that the net adverse effects on the aquatic environment are minimal, any vegetated buffer will comprise no more than 1/3 of the remaining compensatory mitigation acreage after the permanently filled wetlands have been replaced on a one-to-one acreage basis. In addition, compensatory mitigation must address adverse effects on wetland functions and values and cannot be used to offset the acreage of wetland losses that would occur in order to meet the acreage limits of some of the NWPs (e.g., for NWP 39, 1/4 acre of wetlands cannot be created to change a 1/2 acre loss of wetlands to a 1/4 acre loss; however, 1/2 acre of created wetlands can be used to reduce the impacts of a 1/3 acre loss of wetlands). If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed.

(d) To the extent appropriate, permittees should consider mitigation banking and other appropriate forms of compensatory mitigation. If the District Engineer determines that compensatory mitigation is necessary to offset losses of waters of the United States and ensure that the net adverse effects of the authorized work on the aquatic environment are minimal, consolidated mitigation approaches, such as mitigation banks, will be the preferred method of providing compensatory mitigation, unless the District Engineer determines that activity-specific compensatory mitigation is more appropriate, based on which is best for the aquatic environment. These types of mitigation are preferred because they involve larger blocks of protected aquatic environment, are more likely to meet the mitigation goals, and are more easily checked for compliance. If a mitigation bank or other consolidated mitigation approach is not available in the watershed, the District Engineer will consider other appropriate forms of compensatory mitigation to offset the losses of waters of the United States to ensure that the net adverse effects of the authorized work on the aquatic environment are minimal.

20. Spawning Areas. Activities, including structures and work in navigable waters of the United States or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.

21. Management of Water Flows. To the maximum extent practicable, the activity must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and must not increase water flows from the project site, relocate water, or redirect water flow beyond preconstruction conditions. In addition, the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows.

22. Adverse Effects From Impoundments. If the activity, including structures and work in navigable waters of the United States or discharge of dredged or fill material, creates an impoundment of water, adverse effects on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized to the maximum extent practicable.

23. Waterfowl Breeding Areas. Activities, including structures and work in navigable waters of the United States or discharges of dredged or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

24. Removal of Temporary Fills. Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.

25. Designated Critical Resource Waters. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed threatened and endangered species, coral reefs, State natural heritage sites, and outstanding national resource waters or other waters officially designated by a State as having particular environmental or ecological significance and identified by the District Engineer after notice and opportunity for public comment. The District Engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Except as noted below, discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. Discharges of dredged or fill materials into waters of the United States may be authorized by the above NWPs in National Wild and Scenic Rivers if the activity complies with General Condition 7. Further, such discharges may be authorized in designated

critical habitat for Federally listed threatened or endangered species if the activity complies with General Condition 11 and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service has concurred in a determination of compliance with this condition.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with General Condition 13, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The District Engineer may authorize activities under these NWPs only after he determines that the impacts to the critical resource waters will be no more than minimal.

26. Fills Within 100-Year Floodplains. For purposes of this general condition, 100-year floodplains will be identified through the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps or FEMA- approved local floodplain maps.

(a) Discharges Below Headwaters. Discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the 100-year floodplain at or below the point on a stream where the average annual flow is five cubic feet per second (i.e., below headwaters) are not authorized by NWPs 29, 39, 40, 42, 43, and 44. For NWPs 12 and 14, the prospective permittee must notify the District Engineer in accordance with General Condition 13 and the notification must include documentation that any permanent, above-grade fills in waters of the United States within the 100-year floodplain below headwaters comply with FEMA or FEMA-approved local floodplain construction requirements.

(b) Discharges in Headwaters (i.e., above the point on a stream where the average annual flow is five cubic feet per second).

(1) Flood Fringe. Discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the flood fringe of the 100-year floodplain of headwaters are not authorized by NWPs 12, 14, 29, 39, 40, 42, 43, and 44, unless the prospective permittee notifies the District Engineer in accordance with General Condition 13. The notification must include documentation that such discharges comply with FEMA or FEMA-approved local floodplain construction requirements.

(2) Floodway. Discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the floodway of the 100-year floodplain of headwaters are not authorized by NWPs 29, 39, 40, 42, 43, and 44. For NWPs 12 and 14, the permittee must notify the District Engineer in accordance with General Condition 13 and the notification must include documentation that any permanent, above grade fills proposed in the floodway comply with FEMA or FEMA- approved local floodplain construction requirements.

D. Further Information

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other Federal, State, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project.

General Conditions

1. Discharges of dredged or fill material into waters of the United States must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site). The permittee shall provide a mitigation/monitoring plan for any activity where the adverse impact on special aquatic sites exceeds 0.10 acre (4,356 sq. ft.) or is determined to be more than minimal impact. In determining the minimal impact threshold, the Districts will consider the direct and secondary impacts of the fill or work and any mitigation measures. A wetland delineation report is also required. NOTE: An important element of any mitigation plan for projects in or near streams, other open waters and wetlands is the requirement for vegetated buffers. Therefore, all mitigation plans should include a minimum 50-foot wide buffer between the edge of the project site and the waters and/or wetlands to be affected unless a lesser distance has been specifically approved under the RGP.

2. The permittee shall, if mitigation is required, develop the mitigation site concurrently with site construction. This will assure that aquatic functions are not lost for long periods of time which could adversely affect water quality and wildlife.

3. The permittee shall ensure that sedimentation and soil erosion control measures are in place prior to any construction activity. This shall include the installation of straw bale barriers, silt fencing and/or other approved methods to control sedimentation and erosion.

4. The permittee shall ensure that areas disturbed by any construction activity, including channel banks, are immediately stabilized and revegetated with a combination of grasses, legumes and shrubs compatible to the affected area.

5. The permittee shall ensure that all in-stream construction activity is not performed during periods of high stream flow or during the fish spawning season between April 1 through June 30 without first contacting the IDNR, Division of Fish and Wildlife for their expertise on impacts to the fishery resource. Additionally, the discharge of dredged and/or fill material in known waterfowl breeding areas must be avoided to the maximum extent practicable.

6. The permittee will ensure that the activity authorized will not disrupt movement of those aquatic species indigenous to the waterbody, including those species which normally migrate through the area unless the activity's specific purpose is to impound water.

7. The permittee shall ensure that all construction equipment is refueled and maintained on an upland site away from existing streams, drainageways and wetland areas. Heavy equipment working in wetlands must be placed on mats, or other measures taken to minimize soil disturbance.

8. The permittee must provide a copy of the site specific State Section 401 WQC before the Corps will authorize a project under the RGP.

9. The permittee must comply with any case specific special conditions added by the Corps or by the State Section 401 WQC. The conditions imposed in the State Section 401 WQC are also conditions of this RGP.

10. The permittee shall assure that no activity authorized by the RGP may cause more than a minimal adverse effect on navigation.

11. The permittee shall ensure proper maintenance of any structure or fill authorized by this RGP, including maintenance to ensure public safety.

12. The permittee shall not perform any work within any Wild and Scenic Rivers or in any river officially designated as a "study river" for possible inclusion in the system, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity authorized by the RGP will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal Land Management agency in the area (e.g. U.S. Forest Service, Bureau of Land Management or the U.S. Fish and Wildlife Service).

13. The permittee shall not perform any work under the RGP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. The permittee shall notify the District Engineer if any listed species or critical habitat might be affected or is in the vicinity of the project, and shall not begin work under the RGP until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. Authorization of an activity under the RGP does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act.

14. The permittee shall not perform any activity under the RGP which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places until the District Engineer has complied with the provisions of 33 CFR Part 325, Appendix C. The permittee must notify the District Engineer if the activity authorized by the RGP may affect any historic properties listed, determined to be eligible or which the permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin construction until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology.

Further Information:

1. Congressional Authorities: You have been so authorized to undertake the activity described above pursuant to:

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

Section 404 of the Clean Water Act (33 U.S.C. 1344).

2. Limits of this authorization.

a. The Regional permit does not obviate the need to obtain Federal, state, or local authorizations required by law.

b. The Regional permit does not grant any property rights or exclusive privileges.

c. The Regional permit does not authorize any injury to the property or rights of others.

d. The Regional permit does not authorize interference with any existing or proposed Federal project.

e. The Regional Permit authorizing the activity expires on August 1, 1997, unless it is reissued without modification or the activity complies with any subsequent modification of the Regional. If the Regional permit is not reissued for the activity in question, activities which have commenced construction or are under contract to commence in reliance upon the Regional Permit will remain authorized provided the activity is completed by July 31, 1998.

3. Limits of Federal Liability. In issuing the Regional permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by the Regional permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modifications, suspension, or revocation of the Regional permit.

4. Reliance on Applicant's Data: The verification by this office that the project conforms with the Regional permit was made in reliance of the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this project at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of the Regional permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision and/or our verification that the activity complies with the Regional permit.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of the Regional permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. The Regional Permit does not apply to:

a. Activities which would impact historical, cultural, or archaeological sites or practices as provided in the National Historic Preservation Act of 1966 and the Archaeological and Historic Preservation Act of 1974.

b. Sites included in the National Registry of Natural Landmarks.

c. Areas where Federally-listed endangered, threatened, or proposed species occur.

d. Any other areas named in Acts of Congress or Presidential Proclamations as National Wildlife Refuges, National Rivers, components of the National Wild and Scenic River System, National Wilderness Areas, National Recreation Areas, National Lakeshores, National Parks, National Monuments, and such areas as may be established under Federal Law for similar and related purposes.??

NATIONWIDE PERMIT COMPLETION REPORT
Detroit District, Corps of Engineers

CELRE-RG-A-S 04-145-022-0

Commander
U.S. Army Engineer District, Detroit
ATTN: Regulatory Office
P.O. Box 1027
Detroit, Michigan 48231-1027

Dear Sir:

This is in regard to Department of the Army File No. 04-145-022-0, issued to City of Hobart Parks & Recreation Department on August 16, 2004, to discharge fill for a bank stablization and boat ramp repair/replacement project in Lake George at Hobart, Indiana. I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the permit, and mitigation (if required) was completed in accordance with the permit conditions.

The work was completed on:
(Date work completed)

(Signature of Permittee) (Date)

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the above address, within 10 days after completion of work.

Please note that your permitted activity is subject to compliance inspection by the U.S. Army Corps of Engineers' representatives. If you fail to comply with this permit you are subject to permit suspension, modification or revocation. revocation.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We make Indiana a cleaner, healthier place to live.

Joseph E. Kernan
Governor

Lori F. Kaplan
Commissioner

100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015
(317) 232-8603
(800) 451-6027
www.IN.gov/idem

May 14, 2004

VIA CERTIFIED MAIL 7002 0510 0004 2630 3661

Mr. Mike Farrell
Superintendent
City of Hobart
Parks and Recreation Department
111 East Old Ridge Road
Hobart, IN 46342

Dear Mr. Farrell:

Re: Section 401 Water Quality Certification
Project: Jerry Pavese Park Bank Stabilization
IDEM No.: 2004-136-45-MTM-A
County: Lake

Office of Water Quality staff has reviewed your application dated March 22, 2004, and received March 25, 2004, for Section 401 Water Quality Certification. According to the application it is proposed to stabilize the shoreline of Jerry Paves Park along Deep River/Lake George using a combination of bioengineering techniques and riprap. Additionally, it is proposed to repair public access locations and remove an existing boat launch.

Based on available information, it is the judgment of this office that the proposed project will comply with the applicable provisions of 327 IAC 2 and Sections 301, 302, 303, 306, and 307 of the Clean Water Act if the recipient of the certification complies with the conditions set forth below. Therefore, subject to the following conditions, the Indiana Department of Environmental Management (IDEM) hereby grants Section 401 Water Quality Certification for the project described in your application dated March 22, 2004, and received March 25, 2004. Any changes in project design or scope not detailed in the application described above or modified by the conditions below are not authorized by this certification.

GENERAL CONDITIONS:

The recipient of the certification shall:

1. Deposit any dredged material in a contained upland disposal area to prevent sediment run-off to any waterbody. Dispose of all dredged and excavated material according to the requirements of 329 IAC 10, governing Solid Waste Land Disposal Facilities. Your project information may be forwarded to the IDEM Office of Land Quality, Industrial Waste Section for review. Sampling may be required to determine if the dredged sediment is contaminated. Failure to properly dispose of contaminated sediment may result in enforcement action against you.

2. Install erosion control methods prior to any soil disturbance to prevent soil from leaving the construction site. Appropriate erosion control methods include, but are not limited to, straw bale barriers, silt fencing, erosion control blankets, phased construction sequencing, and earthen berms. Monitor and maintain erosion control structures and devices regularly, especially after rain events, until all soils disturbed by construction activities have been permanently stabilized.

3. Clearly mark the construction limits shown in the attached plans at the project site during construction.

4. Allow the commissioner or an authorized representative of the commissioner (including an authorized contractor), upon the presentation of credentials:

   a. to enter upon the recipient of the certification's property;
   b. to have access to and copy at reasonable times any records that must be kept under the conditions of this certification;
   c. to inspect, at reasonable times, any monitoring or operational equipment or method; collection, treatment, pollution management or discharge facility or device; practices required by this certification; and any mitigation wetland site;
   d. to sample or monitor any discharge of pollutants or any mitigation wetland site.

5. Complete all approved discharges no later than two (2) years of the date of issuance of this Section 401 Water Quality Certification. The applicant may request a one (1) year extension to the Section 401 Water Quality Certification by submitting a written request ninety (90) days prior to the deadline stated above. The written request shall contain an account of what discharges and mitigation have been completed and reasons for the need of the extension.

This granting of Section 401 Water Quality Certification does not relieve the recipient of the certification from the responsibility of obtaining any other permits or authorizations that may be required for this project or related activities from IDEM or any other agency or person. You may wish to contact the Indiana Department of Natural Resources at 317-232-4161 concerning the possible requirement of natural freshwater lake or floodway permits, or the IDEM stormwater permits section at 317-233-1864 concerning the possible need for 327 IAC 15-5 (Rule 5) permits if you plan to disturb greater than 5 acres of soil during construction.

This certification does not:
(1) authorize impacts or activities outside the scope of this certification;
(2) authorize any injury to persons or private property or invasion of other private rights,

or any infringement of federal, state or local laws or regulations;
(3) convey any property rights of any sort, or any exclusive privileges;
(4) preempt any duty to obtain federal, state or local permits or authorizations required by law for the execution of the project or related activities; or
(5) authorize changes in the plan design detailed in the application.

Failure to comply with the terms and conditions of this Section 401 Water Quality Certification may result in enforcement action against the recipient of the certification. If an enforcement action is pursued, the recipient of the certification could be assessed up to $25,000 per day in civil penalties. The recipient of the certification may also be subject to criminal liability if it is determined that the Section 401 Water Quality Certification was violated willfully or negligently.

This certification is effective 18 days from the mailing of this notice unless a petition for review and a petition for stay of effectiveness are filed within this 18-day period. If a petition for review and a petition for stay of effectiveness are filed within this period, any part of the certification within the scope of the petition for stay is stayed for 15 days, unless or until an Environmental Law Judge further stays the certification in whole or in part.

This decision may be appealed in accordance with IC 4-21.5, the Administrative Orders and Procedures Act. The steps that must be followed to qualify for review are:

1. You must petition for review in a writing that states facts demonstrating that you are either the person to whom this decision is directed, a person who is aggrieved or adversely affected by the decision, or a person entitled to review under any law.

2. You must file the petition for review with the Office of Environmental Adjudication (OEA) at the following address:

   Office of Environmental Adjudication
   100 North Senate Avenue
   IGCN Room N1049
   Indianapolis, IN 46204

3. You must file the petition within eighteen (18) days of the mailing date of this decision. If the eighteenth day falls on a Saturday, Sunday, legal holiday, or other day that the OEA offices are closed during regular business hours, you may file the petition the next day that the OEA offices are open during regular business hours. The petition is deemed filed on the earliest of the following dates: the date it is personally delivered to OEA; the date that the envelope containing the petition is postmarked if it is mailed by United States mail; or, the date it is shown to have been deposited with a private carrier on the private carrier's receipt, if sent by private carrier.

Identifying the certification, decision, or other order for which you seek review by number, name of the applicant, location, or date of this notice will expedite review of the petition.

Note that if a petition for review is granted pursuant to IC 4-21.5-3-7, the petitioner will, and any other person may, obtain notice of any prehearing conferences, preliminary hearings, hearings, stays, and any orders disposing of the proceedings by requesting copies of such notices from OEA.

If you have procedural questions regarding filing a petition for review you may contact OEA at 317-232-8591.

If you have any questions about this certification, please contact Mr. Marty Maupin, Project Manager, of my staff at 317-233-2471, or you may contact the Office of Water Quality through the IDEM Environmental Helpline (1-800-451-6027).

Sincerely,

Martha Clark Mettler

Martha Clark Mettler, Chief
Watershed Branch
Office of Water Quality

cc: James Gries, South Bend Office, USACE
John Richardson, J.F. New & Associates, Inc.
Elizabeth McCloskey, USFWS
Keith Poole, IDNR

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

MAILED NOV 2 2 2004

CERTIFICATE OF APPROVAL
PUBLIC FRESHWATER LAKE

APPLICATION # : PL-19764

LAKE : Lake George

APPLICANT : City of Hobart
Mike Farrell
111 Old Ridge Road
Hobart, IN 46342-4357

AGENT : JF New & Associates, Inc
John Richardson
708 Roosevelt Road, Suite A
Walkerton, IN 46574-1220

AUTHORITY : IC 14-26-2 with 312 IAC 11

DESCRIPTION : A bioengineered seawall will be constructed across 690' of the applicant's frontage. Another bioengineered seawall, consisting of riprap with shrubs planted on three-foot centers, will also be constructed across 1300' of the applicant's frontage. Three (3) 30' wide x 10' long public access sites will be repaired along 90' of the applicant's frontage. A 3' thick layer of riprap placed over geotextile fabric will be placed on the access sites. The existing boat ramp will be removed and replaced with a 30' wide articulated concrete boat ramp. The new boat ramp will be constructed across 30' of the applicant's frontage. The ramp will extend approximately 40' lakeward of the lake's legal shoreline. In addition, a 45' long x 5' wide temporary pier will extend approximately 45' lakeward of the lake's legal shoreline. There will be a 20' x 8' extension at the lakeward end of the pier. Details of the project are contained in information received electronically at the Division of Water on March 26, 2004 and in information and plans received at the Division of Water on April 1, 2004, May 6, 2004, August 27, 2004, October 25, 2004 and November 15, 2004.

LOCATION : Beginning on the north shore of Lake George, approximately 1500' west of the east section line and following the shoreline approximately 2200' east at Hobart, Hobart Township, Lake County
S½, NE¼, Section 31, T 36N, R 7W, Gary Quadrangle
UTM Coordinates: Downstream 4597377 North, 478458 East

APPROVED BY :

James J. Hebenstreit, P.E., Assistant Director
Division of Water

APPROVED ON : November 22, 2004

Attachments: Notice Of Right To Administrative Review
General Conditions
Special Conditions
Service List

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

NOTICE OF RIGHT TO ADMINISTRATIVE REVIEW

APPLICATION #: PL- 19764

This signed document constitutes the issuance of a permit by the Department of Natural Resources, subject to the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

The permit or any of the conditions or limitations which it contains may be appealed by applying for administrative review. Such review is governed by the Administrative Orders and Procedures Act, IC 4-21.5, and the Department's rules pertaining to adjudicative proceedings, 312 IAC 3-1.

In order to obtain a review, a written petition must be filed with the Division of Hearings within 18 days of the mailing date of this notice. The petition should be addressed to:

Mr. Stephen L. Lucas, Director
Division of Hearings
Room W272
402 West Washington Street
Indianapolis, Indiana 46204

The petition must contain specific reasons for the appeal and indicate the portion or portions of the permit to which the appeal pertains.

If an appeal is filed, the final agency determination will be made by the Natural Resources Commission following a legal proceeding conducted before an Administrative Law Judge. The Department of Natural Resources will be represented by legal counsel.

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

GENERAL CONDITIONS

APPLICATION #: PL- 19764

(1) If any archaeological artifacts or human remains are uncovered during construction, federal law and regulations (16 USC 470, et seq.; 36 CFR 800.11, et al) and State Law (IC 14-21-1) require that work must stop and that the discovery must be reported to the Division of Historic Preservation and Archaeology within 2 business days.

Division of Historic Preservation and Archaeology
Room W274
402 West Washington Street
Indianapolis, IN 46204

Telephone: (317) 232-1646, FAX: (317) 232-8036

(2) This permit must be posted and maintained at the project site until the project is completed.

(3) This permit does not relieve the permittee of the responsibility for obtaining additional permits, approvals, easements, etc. as required by other federal, state, or local regulatory agencies.These agencies include, but are not limited to:

Agency	Telephone Number
*US Army Corps of Engineers, Detroit District	(313) 226-2218
Lake County Drainage Board	(219) 755-3755
Indiana Department of Environmental Management	(317) 233-8488 or (800) 451-6027
Local city or county planning or zoning commission	

(4) This permit must not be construed as a waiver of any local ordinance or other state or federal law.

(5) This permit does not relieve the permittee of any liability for the effects which the project may have upon the safety of the life or property of others.

(6) This permit may be revoked by the Department of Natural Resources for violation of any condition, limitation or applicable statute or rule.

(7) This permit shall not be assignable or transferable without the prior written approval of the Department of Natural Resources. To initiate a transfer contact:

Mr. Michael W. Neyer, PE, Director
Division of Water
Room W264
402 West Washington Street
Indianapolis, IN 46204

Telephone: (317) 232-4160, Toll Free: (877) 928-3755
FAX: (317) 233-4579

(8) The Department of Natural Resources shall have the right to enter upon the site of the permitted activity for the purpose of inspecting the authorized work.

(9) The receipt and acceptance of this permit by the applicant or authorized agent shall be considered as acceptance of the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

SPECIAL CONDITIONS

APPLICATION #: PL- 19764

PERMIT VALIDITY : This permit is valid for 24 months from the "Approved On" date shown on the first page. If work has not been completed by November 22, 2006 the permit will become void and a new permit will be required in order to continue work on the project.

This permit becomes effective 18 days after the "MAILED" date shown on the first page. If both a petition for review and a petition for a stay of effectiveness are filed before this permit becomes effective, any part of the permit that is within the scope of the petition for stay is stayed for an additional 15 days.

CONFORMANCE : Other than those measures necessary to satisfy the "General Conditions" and "Special Conditions", the project must conform to the information received by the Department of Natural Resources on: March 26, 2004, April 1, 2004, May 6, 2004, August 27, 2004, October 25, 2004 and November 15, 2004. Any deviation from the information must receive the prior written approval of the Department.

Number	Special Condition
(1)	minimize the movement of resuspended bottom sediment from the immediate project area
(2)	revegetate all bare and disturbed areas landward of the shoreline with a mixture of grasses (excluding all varieties of tall fescue) and legumes as soon as possible upon completion
(3)	all excavated material must be properly spread landward of the shoreline on the property described on page 1 under "DESCRIPTION" or completely removed from the project site such that erosion and off-site sedimentation of the material is prevented
(4)	pursuant to 312 IAC 11-4-2 (h), do not place an impermeable material or structure (including but not limited to concrete, steel, or vinyl retaining walls) directly behind the new seawall approved by this permit
(5)	construct that portion of the boat ramp lakeward of the lake's shoreline such that it is below the water surface when the lake is at its normal water level

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

SERVICE LIST

APPLICATION #: PL- 19764

City of Hobart
Mike Farrell
111 Old Ridge Road
Hobart, IN 46342-4357

JF New & Associates, Inc
John Richardson
708 Roosevelt Road, Suite A
Walkerton, IN 46574-1220

*US Army Corps of Engineers, Detroit District
Gary Mannesto
Regulatory Functions Branch
PO Box 1027
Detroit, MI 48231-1027

Lake County Drainage Board
County Surveyor
County Government Center
2293 North Main Street
Crown Point, IN 46307-1854

*Indiana Department of Natural Resources
North Region Headquarters Dist 10
Division of Law Enforcement
1124 North Mexico Road
Peru, IN 46970

Steve Davis
Indiana Department of Natural Resources
100 West Water Street
Michigan City, IN 46360-1310

Hobart Plan Commission
414 Main Street
Hobart, IN 46342

Lake County Board of Commissioners
2293 North Main Street
Crown Point, IN 46307-1854

Lake County Soil and Water Conservation District
928 South Court Street, Suite C
Crown Point, IN 46307-4848

Staff Assignment:

Administrative	: Stuart L. Peckham
Technical	: Joseph D. Mapes
Environmental	: Christie L. Kiefer

APPENDIX B

DESIGN PLANS

FRED ROSE & JERRY PAVESE PARK
SHORELINE STABILIZATION DESIGN REPORT

LAKE COUNTY, INDIANA

REVISIONS:		
08/20/2004	CORRECTIONS AS PER JBR	SJP
12/02/2004	TITLE BLOCK CHANGES	SKL

JFNew

http://www.jfnew.com

Corporate Office
708 Roosevelt Road
Walkerton, Indiana 46574
574-586-3400 fax 574-586-3446

Cincinnati Office
8080 Beckett Center Dr., Suite 226
West Chester, Ohio 45069
513-942-3446 fax 513-942-3447

Illinois Office
1378 Main Street
Crete, Illinois 60417
708-367-1130 fax 708-367-1132

Indianapolis Office
6640 Parkdale Place, Suite S
Indianapolis, Indiana 46254
317-388-1982 fax 317-388-1986

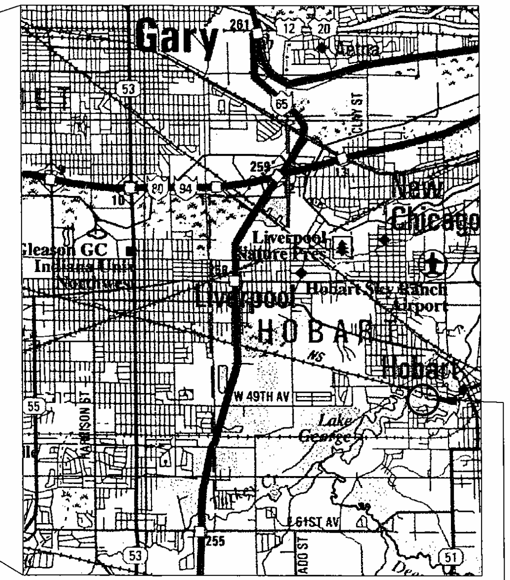
Michigan Office
600 South Beacon
Grand Haven, Michigan 49417
616-847-1680 fax 616-847-9970

JERRY PAVESE PARK SHORELINE STABILIZATION PROJECT

LAKE COUNTY HOBART, INDIANA

DECEMBER 2004

INDEX OF DRAWINGS



PROJECT LOCATION

VICINITY MAP

N

ANDREW L. BENDER
REGISTERED
No. 10100192
STATE OF INDIANA
PROFESSIONAL ENGINEER

Our mission is to provide the highest quality environmental services to our clients while positively impacting the lives of our employees and the conservation of natural resources through profitability and stewardship.

JFNew

Jerry Pavese Park Shoreline Stabilization
City of Hobart
Lake County, Indiana
TITLE SHEET AND SHEET INDEX

DRAWN BY:	JFH
DESIGNED BY:	JBR
CHECKED BY:	DJL
DATE:	DEC 2004
JOB NO:	030962
SCALE:	AS NOTED

01-COVER 030962.DWG

DRAWING NO.

1

OF 8

REVISIONS:

	Date	Description	By
	08/20/2004	CORRECTIONS AS PER JBR	SJP
	12/02/2004	TITLE BLOCK CHANGES	SKL
	12/08/2004	CORRECTIONS AS PER JBR	JAE

NOTES:

1) Sensitive natural areas not to be disturbed without prior authorization from Owner's representative.

2) All areas disturbed during construction of the shoreline stabilization shall be restored to their previous condition as per special provisions.

3) Survey completed by Rowland and Associates, Inc., Angola, Indiana.

LEGEND

- Sensitive Natural Areas- DO NOT DISTURB
- Approximate Shore Line
- Treatment Type A (See Sheet 4)
- Treatment Type B (See Sheet 5)
- Treatment Type C (See Sheet 6)
- Trees > 6"
- Pine
- Rebar Pin Set by Rowland Associates, Inc.

N

0 80'

SCALE IN FEET

SCALE VERIFICATION
This bar measures 1" on 22"x34" or 1/2" on 11"x17" original. Adjust scale accordingly.

Corporate Office
708 Roosevelt Road
Walkerton, Indiana 46574
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Cincinnati Office
8080 Beckett Center Dr., Suite 226
West Chester, Ohio 45069
513-942-3448 fax 513-942-3447

Illinois Office
1378 Main Street
Crete, Illinois 60417
708-367-1130 fax 708-367-1132

Indianapolis Office
6840 Parkdale Place, Suite S
Indianapolis, Indiana 46254
317-388-1982 fax 317-388-1986

Michigan Office
600 South Beacon
Grand Haven, Michigan 49417
616-847-1680 fax 616-847-9970

JFNew

Jerry Pavese Park Shoreline Stabilization

City of Hobart

Lake County, Indiana

Plan View

DRAWN BY:	JFH
DESIGNED BY:	JBR
CHECKED BY:	DJL
DATE:	DEC 2004
JOB NO:	030962
SCALE:	AS NOTED

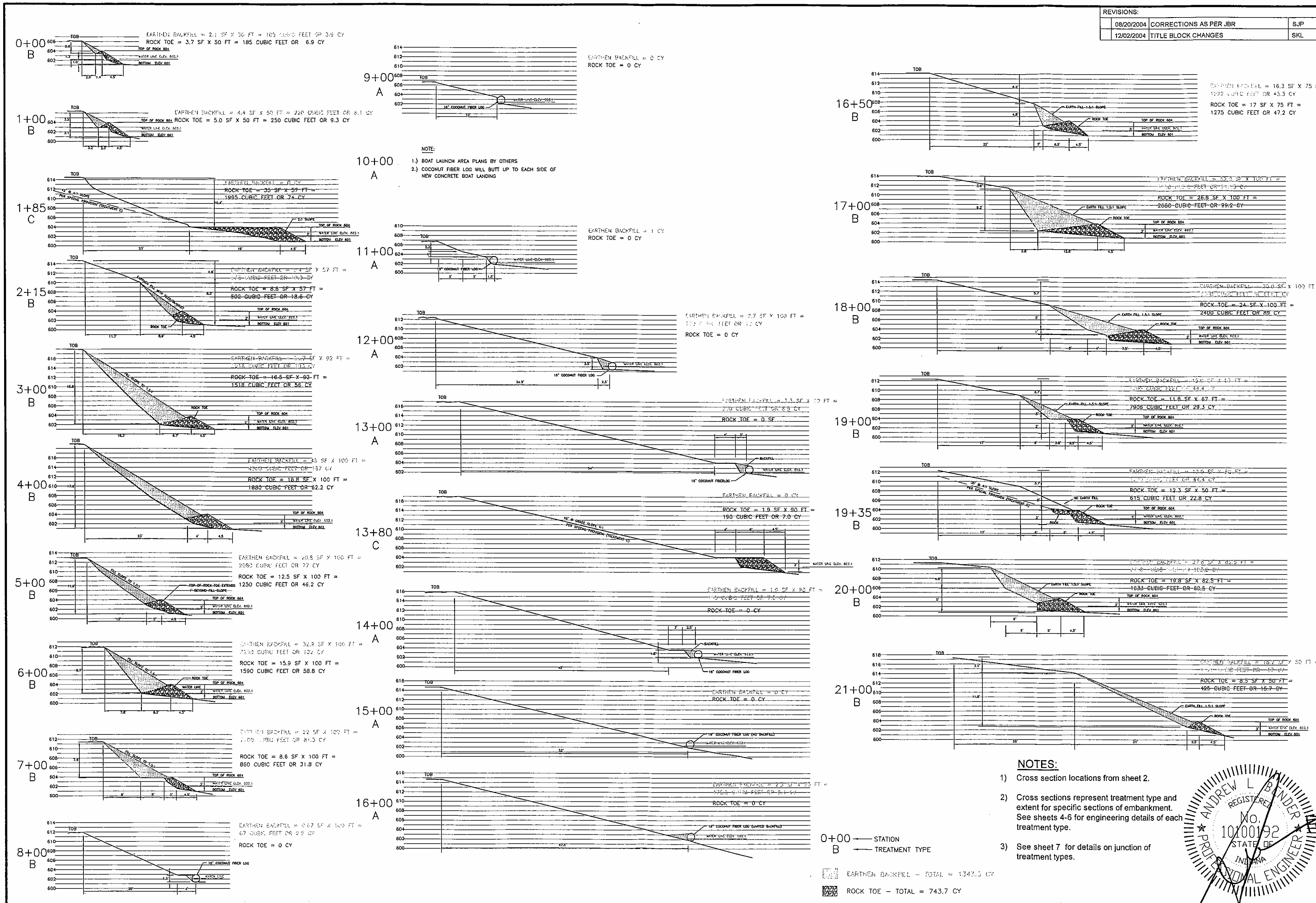
ANDREW L BENDER
REGISTERED
No. 10100192
STATE OF
INDIANA
PROFESSIONAL ENGINEER

02-SITE PLAN.DWG

DRAWING NO.

2

REVISIONS:		
08/20/2004	CORRECTIONS AS PER JBR	SJP
12/02/2004	TITLE BLOCK CHANGES	SKL



NOTES:

1) Cross section locations from sheet 2.
2) Cross sections represent treatment type and extent for specific sections of embankment. See sheets 4-6 for engineering details of each treatment type.
3) See sheet 7 for details on junction of treatment types.

HORZ. & VERT. SCALE IN FEET (0 – 10')

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Cincinnati Office: 8083 Beckett Center Dr., Suite 225, West Chester, Ohio 45069, 513-942-3445 fax 513-942-3447
Illinois Office: 1375 Main Street, Crete, Illinois 60417, 708-367-1130 fax 708-367-1132
Indianapolis Office: 6840 Parkdale Place, Suite S, Indianapolis, Indiana 46254, 317-388-1982 fax 317-388-1986
Michigan Office: 600 South Beacon, Grand Haven, Michigan 49417, 616-847-1680 fax 616-847-3970

JFNew

Jerry Pavese Park Shoreline Stabilization
City of Hobart
Lake County, Indiana

CROSS SECTIONS (CUT AND FILL CALCS)

DRAWN BY:	JFH
DESIGNED BY:	JBR
CHECKED BY:	DJL
DATE:	DEC 2004
JOB NO:	030962
SCALE:	AS NOTED

ANDREW L. BENDER, REGISTERED No. 10100192, STATE OF INDIANA, PROFESSIONAL ENGINEER

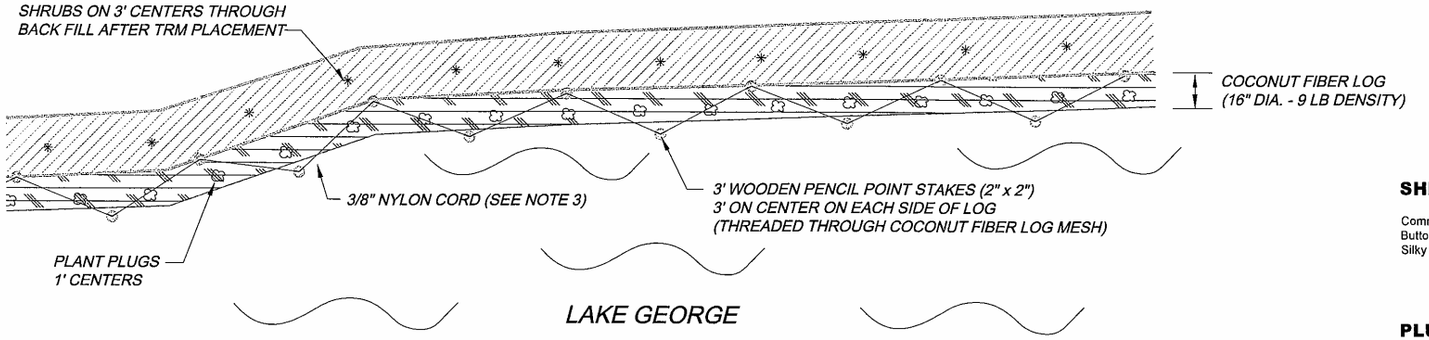
03-XSECTIONS.DWG

DRAWING NO. 3 OF 8

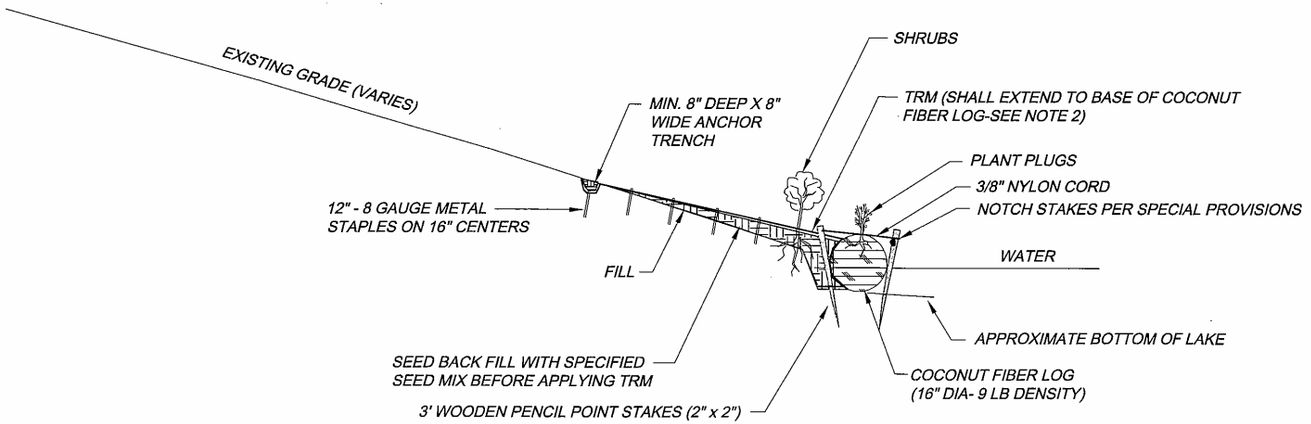
REVISIONS:			
	08/20/2004	CORRECTIONS AS PER JBR	SJP
	12/02/2004	TITLE BLOCK CHANGES	SKL

PAVESE PARK

TYPICAL AERIAL VIEW (TREATMENT LENGTH VARIES)



TYPICAL CROSS SECTION



SHRUBS (SEE SPECIAL PROVISIONS)

Common Name:	Scientific Name:
Buttonbush	*Cephalanthus occidentalis*
Silky Dogwood	*Cornus amomum*

PLUGS (SEE SPECIAL PROVISIONS)

Common Name:	Scientific Name:
Sweetflag	*Acorus calamus*
Hop Sedge	*Carex lupulina*
Woolly Sedge	*Carex pellita*
Tussock Sedge	*Carex stricta*
Buttonbush	*Cephalanthus occidentalis*
Rose Mallow	*Hibiscus laevis*
Blueflag	*Iris versicolor*
Great Blue Lobelia	*Lobelia siphilitica*
Cardinal Flower	*Lobelia cardinalis*
Pickerel Weed	*Pontederia cordata*
Swamp Dock	*Rumex verticillatus*
River Bulrush	*Scirpus fluviatilis*
Soft-stem Bulrush	*Scirpus validus*
Giant Burreed	*Sparganium eurycarpum*

NOTES:

1) This treatment to be applied from Station 8+00 to 9+85, Station 10+35 to 13+70, and Station 14+00 to 15+70.

2) See special provisions for installation details.

3) Nylon cord shall be knotted at every fourth stake.

4) TRM = Turf Reinforcement Mat (North American Green C-350 or equivalent).

ANDREW L BENDER REGISTERED No. 10100192 STATE OF INDIANA PROFESSIONAL ENGINEER 12/9/04

N

0 2'

SCALE IN FEET

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Corporate Office
708 Roosevelt Road
Walkerton, Indiana 46574
574-586-3400 fax 574-586-3448

Cincinnati Office
8000 Beckett Center Dr., Suite 226
West Chester, Ohio 45069
513-942-3448 fax 513-942-3447

Illinois Office
1378 Main Street
Crete, Illinois 60417
708-367-1130 fax 708-367-1132

Indianapolis Office
6510 Parkside Place, Suite 5
Indianapolis, Indiana 46254
317-356-1562 fax 317-356-1568

Michigan Office
600 South Beacon
Grand Haven, Michigan 49417
616-847-1660 fax 616-847-9970

JFNew

Jerry Pavese Park Shoreline Stabilization
City of Hobart
Lake County, Indiana

TREATMENT A DETAILS

DRAWN BY:	JAE
DESIGNED BY:	JBR
CHECKED BY:	DJL
DATE:	DEC 2004
JOB NO:	030992
SCALE:	AS NOTED

04-TREATMENT A.DWG

DRAWING NO.

4

OF 8

REVISIONS:			
	08/20/2004	CORRECTIONS AS PER JBR	SJP
	12/02/2004	TITLE BLOCK CHANGES	SKL
	12/08/2004	CORRECTIONS AS PER JBR	JAE

SEED LIST FOR SLOPE (SEE SPECIAL PROVISIONS)

Common Name:	Scientific Name:
Little Bluestem	*Andropogon scoparius*
Thimbleweed	*Anenome virginiana*
Butterfly Milkweed	*Asclepias tuberosa*
Heath Aster	*Aster ericoides*
Smooth Blue Aster	*Aster laevis*
Arrow-leaved Aster	*Aster sagittifolius*
Wild White Indigo	*Baptisia leucantha*
Side Oats Grama	*Bouteloua curtipendula*
Blue Joint Grass	*Calamagrostis canadensis*
Crested Oval Sedge	*Carex cristatella*
Spreading Oval Sedge	*Carex normalis*
Woolly Sedge	*Carex pellita*
Awl-fruited Oval Sedge	*Carex tribuloides*
Brown Fox Sedge	*Carex vulpinoidea*
Canada Wild Rye	*Elymus canadensis*
Virginia Rye	*Elymus virginicus*
False Sunflower	*Heliopsis helianthoides*
Roundheaded Bush Clover	*Lespedeza capitata*
Rough Blazing Star	*Liatris aspera*
Wild Bergamot	*Monarda fistulosa*
Switch Grass	*Panicum virgatum*
Beardtongue	*Penstemon digitalis*
Purple Prairie Clover	*Petalostemum purpureum*
Yellow Coneflower	*Ratibida pinnata*
Black-eyed Susan	*Rudbeckia hirta*
Rosinweed	*Silphium integrifolium*
Showy Goldenrod	*Solidago speciosa*
Indian Grass	*Sorgastrum nutans*
Prairie Cord Grass	*Spartina pectinata*
Seed Oats	*Avena sativa*
Annual Rye	*Lolium multiflorum*

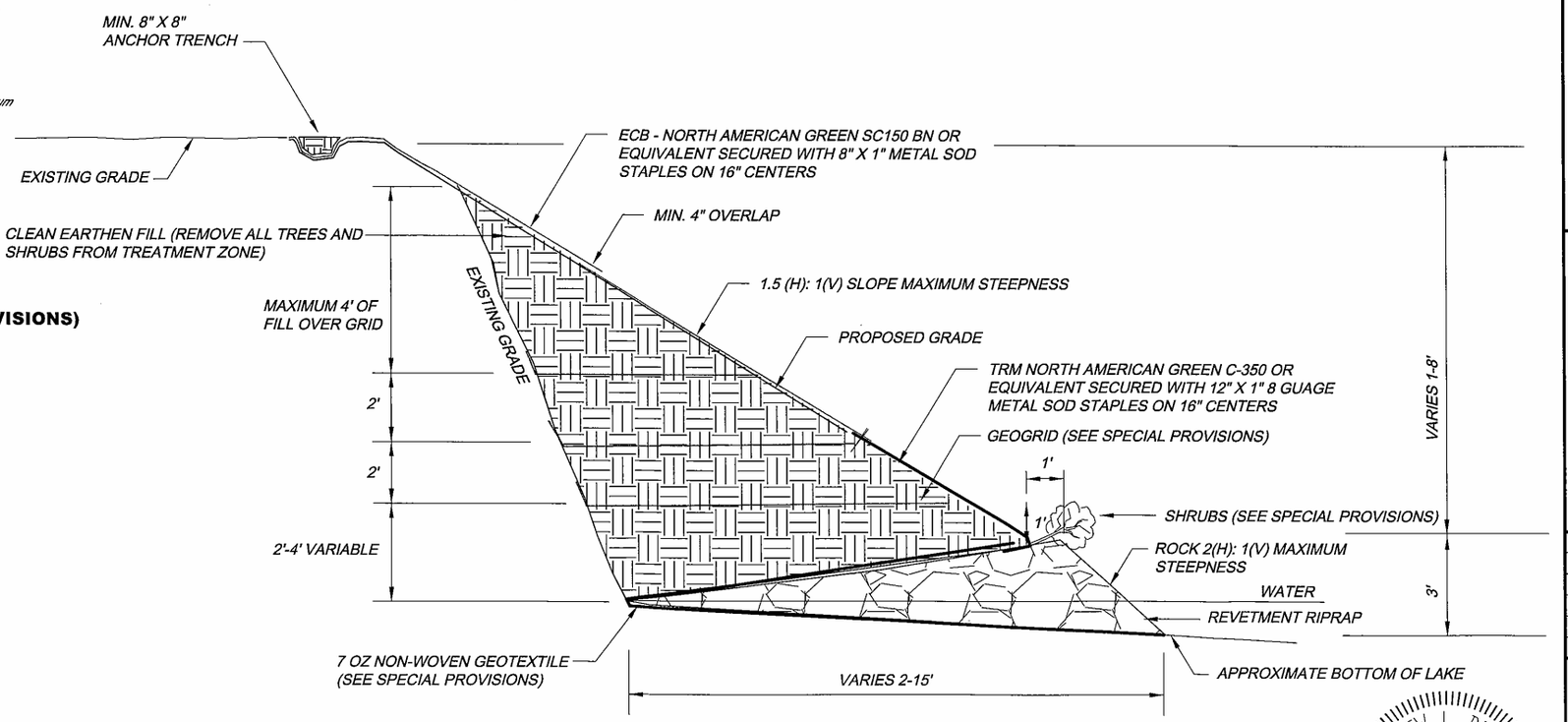
SHRUBS (SEE SPECIAL PROVISIONS)

Common Name:	Scientific Name:
Buttonbush	*Cephalanthus occidentalis*
Silky Dogwood	*Cornus amomum*
Serviceberry	*Amelanchier arborea*
Blackhaw Viburnum	*Viburnum prunifolium*

NOTES:

1) This treatment to be applied from Station 0+00 to 1+74, Station 2+04 to 8+00, Station 15+70 to 19+25, and Station 19+55 to 21+30.
2) Rock shall be placed to a minimum height of 3' above the lake bottom at the toe of the slope.
3) Fill shall be compacted in 6" layers to 95% of standard proctor tests.
4) Geogrid shall be placed on every 2' layer of compacted fill until a maximum of 4' of fill remains above grid.
5) TRM = Turf Reinforcement Mat
   ECB = Erosion Control Blanket

TYPICAL CROSS SECTION



N

0 2'

SCALE IN FEET

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Corporate Office
708 Roosevelt Road
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574-586-3400 fax 574-586-3468

Cincinnati Office
8060 Beckett Center Dr., Suite 220
West Chester, Ohio 45069
513-942-3460 fax 513-942-3447

Illinois Office
1379 Main Street
Crete, Illinois 60417
708-367-1130 fax 708-367-1132

Indianapolis Office
6640 Parkdale Place, Suite G
Indianapolis, Indiana 46254
317-388-1982 fax 317-388-1986

Michigan Office
900 South Beacon
Grand Haven, Michigan 49417
616-847-1580 fax 616-847-9970

JFNew

Jerry Pavese Park Shoreline Stabilization
City of Hobart
Lake County, Indiana

TREATMENT B DETAILS

DRAWN BY:	JAE
DESIGNED BY:	DJL / JBR
CHECKED BY:	JBR
DATE:	DEC 2004
JOB NO:	030962
SCALE:	AS NOTED

ANDREW L BENDER REGISTERED No. 10100192 STATE OF INDIANA PROFESSIONAL ENGINEER

12/8/04

05-TREATMENT.DWG

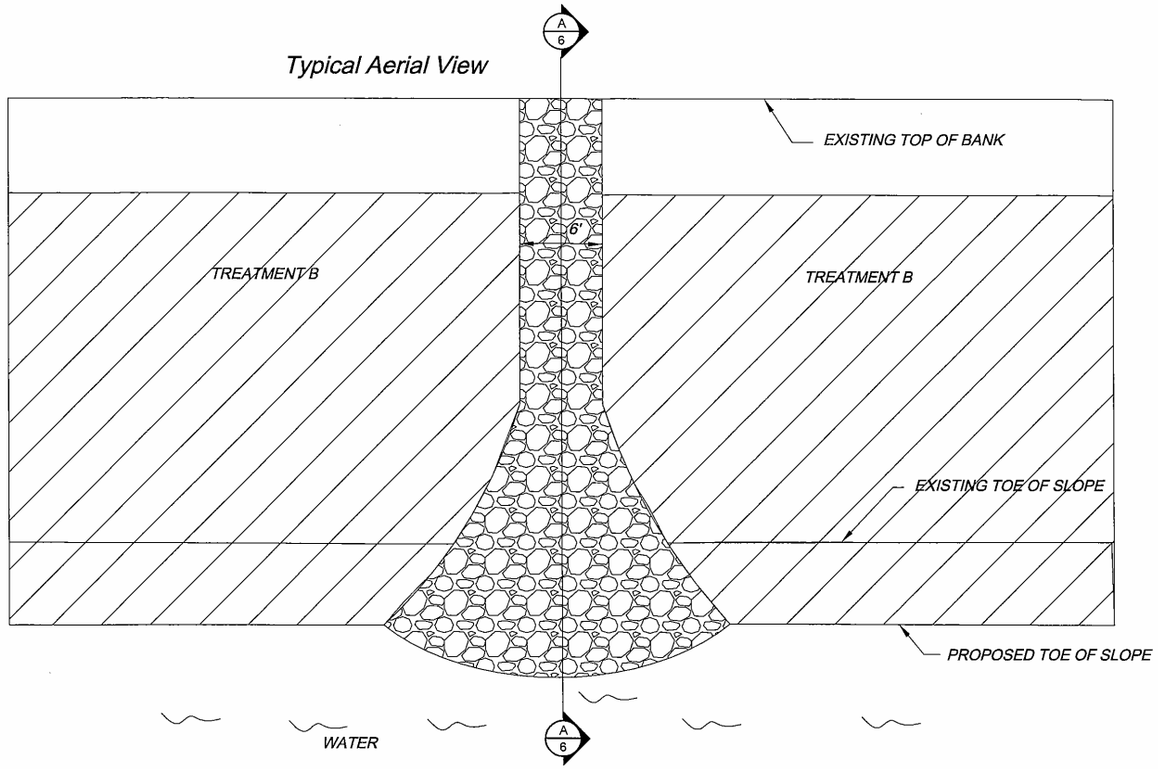
DRAWING NO.

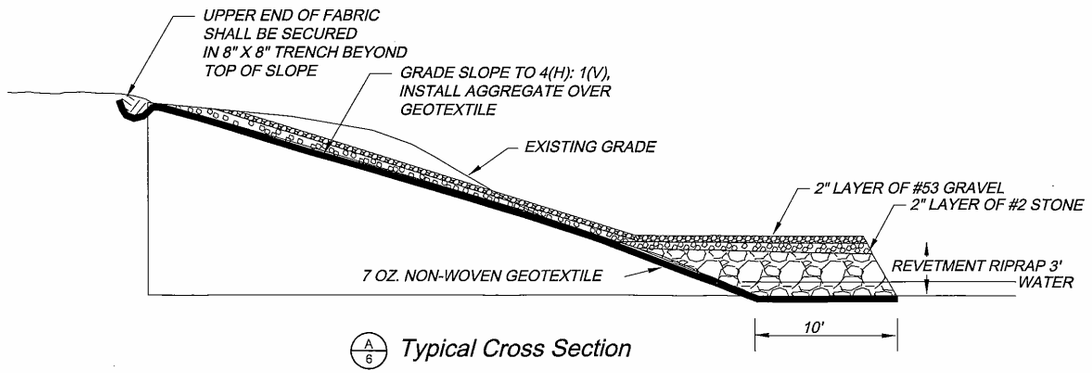
5

OF 8

REVISIONS:			
	08/20/2004	CORRECTIONS AS PER JBR	SJP
	12/02/2004	TITLE BLOCK CHANGES	SKL

Typical Aerial View

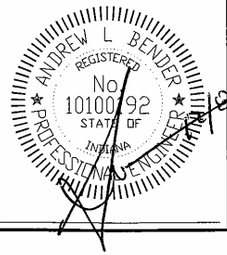




A/6 Typical Cross Section

NOTES:

This treatment to be applied at Stations 1+74 to 2+04, 13+70 to 14+00, and 19+25 to 19+55.



N

0 5'

SCALE IN FEET

SCALE VERIFICATION
This bar measures 1" on 22"x34" or 1/2" on 11"x17" signed. Adjust scale accordingly

Corporate Office
708 Roosevelt Road
Walkerton, Indiana 46574
574-586-3400 fax 574-586-3449

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6060 Seckett Centre Dr., Suite 226
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616-847-1580 fax 616-847-9970

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Jerry Pavese Park Shoreline Stabilization
City of Hobart
Lake County, Indiana

TREATMENT C DETAILS

DRAWN BY:	JAE
DESIGNED BY:	JBR
CHECKED BY:	DJL
DATE:	DEC 2003
JOB NO:	030962
SCALE:	AS NOTED

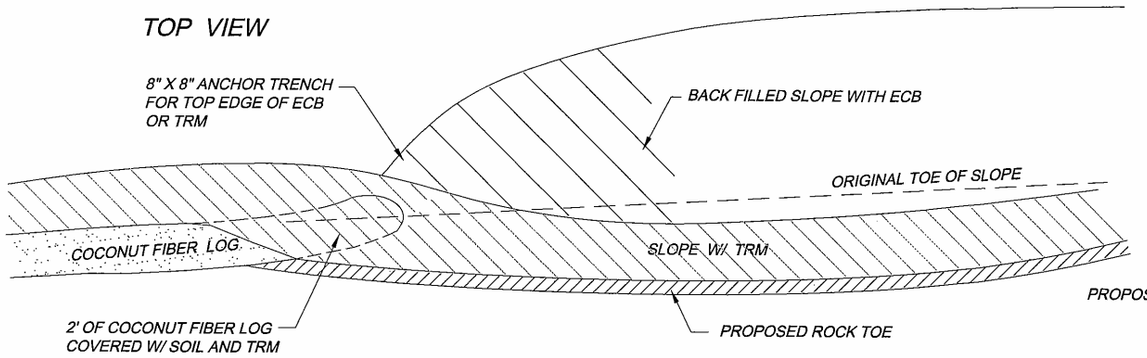
06-TREATMENT C.DWG

DRAWING NO.

6

OF 8

REVISIONS:			
	12/02/2004	TITLE BLOCK CHANGES	SKL



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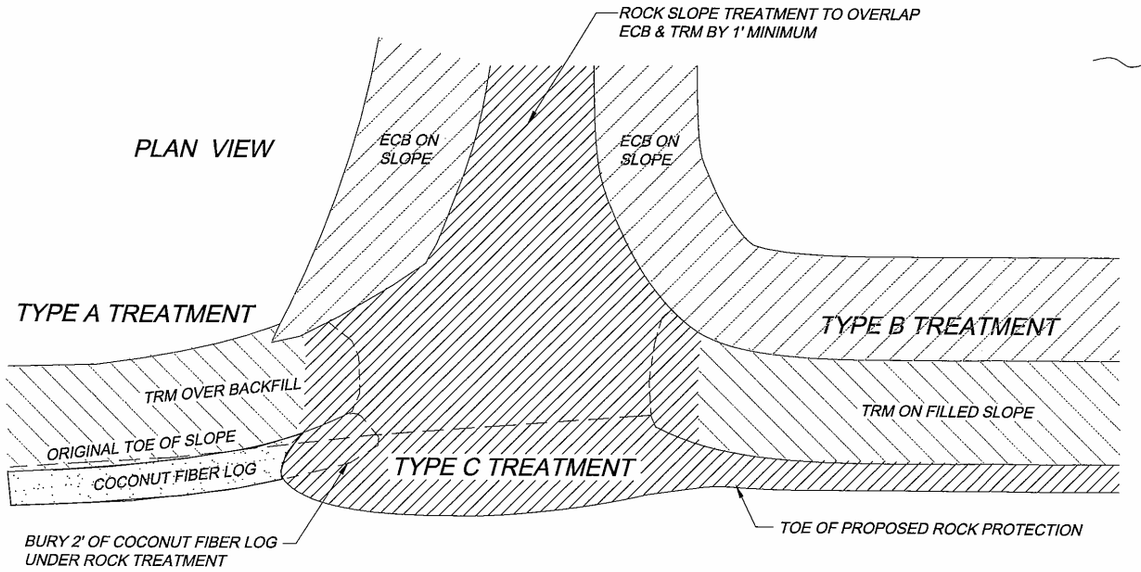

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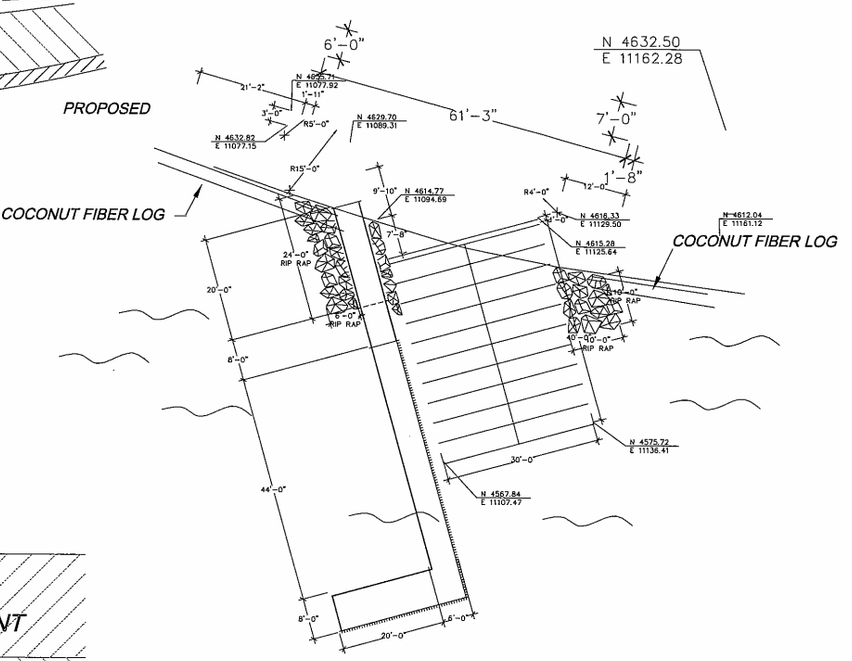

TYPE A TREATMENT AT PROPOSED BOAT LAUNCH AND PIER

NOTE: PIER AND LAUNCH RAMP DESIGN BY OTHERS

ANDREW L BENDER REGISTERED No. 10100192 STATE OF INDIANA PROFESSIONAL ENGINEER

N

0 5'

SCALE IN FEET

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TREATMENT CONNECTION DETAILS

DRAWN BY:	JAE
DESIGNED BY:	JBR
CHECKED BY:	DJL
DATE:	DEC 2004
JOB NO:	030962
SCALE:	AS NOTED

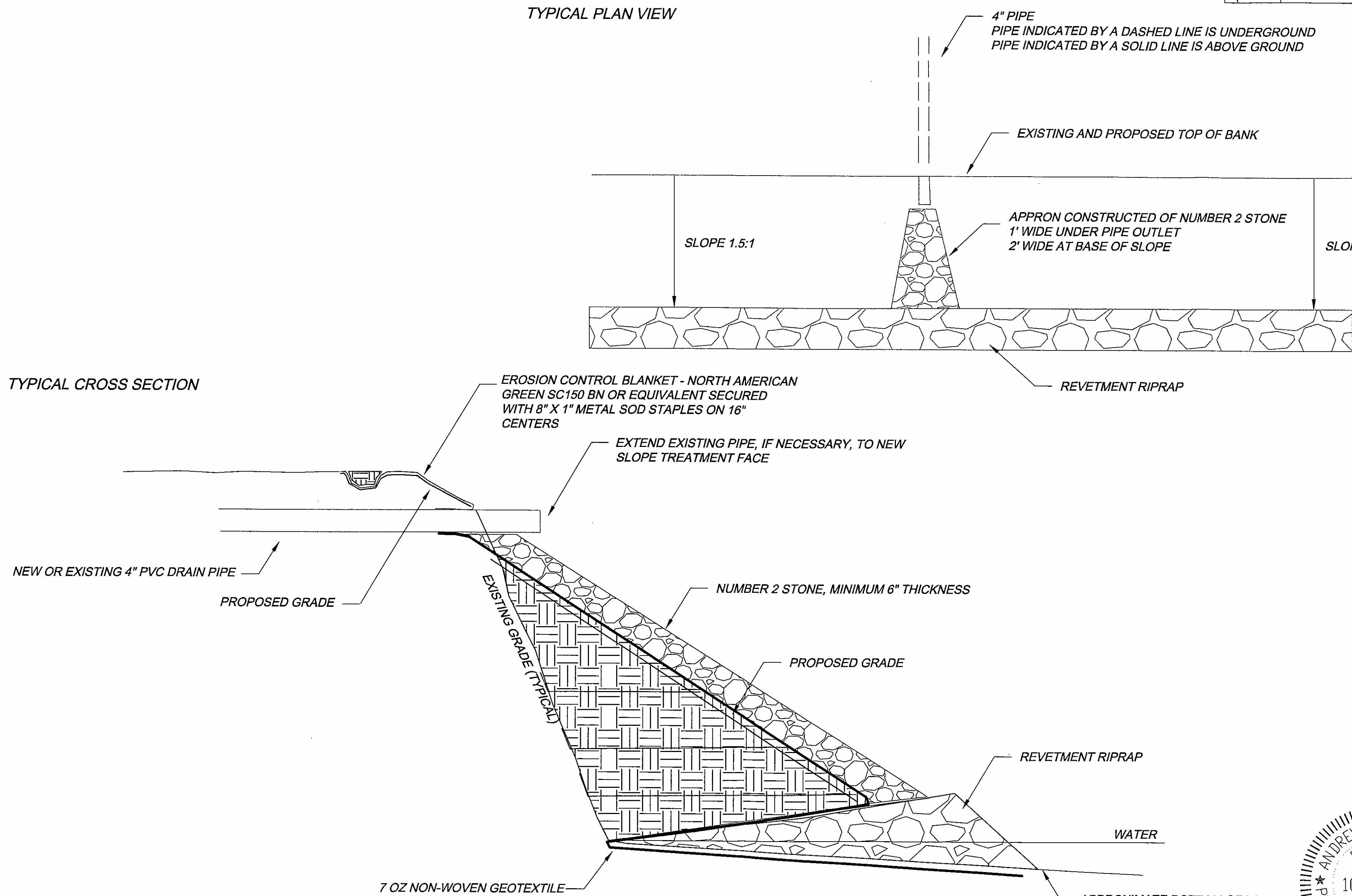
07-TREATMENT JOINTS.DWG

DRAWING NO.

7

OF 8

REVISIONS:			
	08/20/2004	CORRECTIONS AS PER JBR	SJP
	12/02/2004	TITLE BLOCK CHANGES	SKL
	12/08/2004	CORRECTIONS AS PER JBR	JAE



NOTES:

This treatment to be applied at approximate Stations 20+10 and 3+50 (contractor to field verify locations).

N

0 2'

SCALE IN FEET

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City of Hobart
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PIPE OUTLET DETAILS

DRAWN BY:	SJP
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CHECKED BY:	DJL
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JOB NO:	030962
SCALE:	AS NOTED

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STATE OF INDIANA
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08-PIPE OUTLET.DWG

DRAWING NO.

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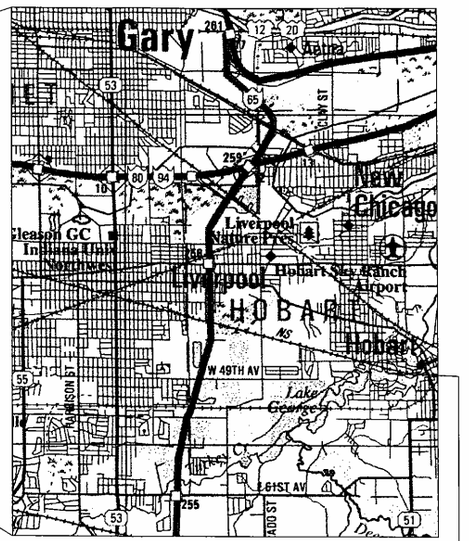
FRED ROSE PARK SHORELINE STABILIZATION PROJECT

LAKE COUNTY HOBART, INDIANA

DECEMBER 2004

INDEX OF DRAWINGS



PROJECT LOCATION

VICINITY MAP

N

ANDREW L BENDER
REGISTERED
No. 10100192
STATE OF INDIANA
PROFESSIONAL ENGINEER

12/08/04

Our mission is to provide the highest quality environmental services to our clients while positively impacting the lives of our employees and the conservation of natural resources through prosperity and stewardship.

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Fred Rose Park Shoreline Stabilization
City of Hobart
Lake County, Indiana

TITLE SHEET AND SHEET INDEX

DRAWN BY:	JFH
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JOB NO:	030962
SCALE:	AS NOTED

01-COVER 030962.DWG

DRAWING NO.

1

OF 9

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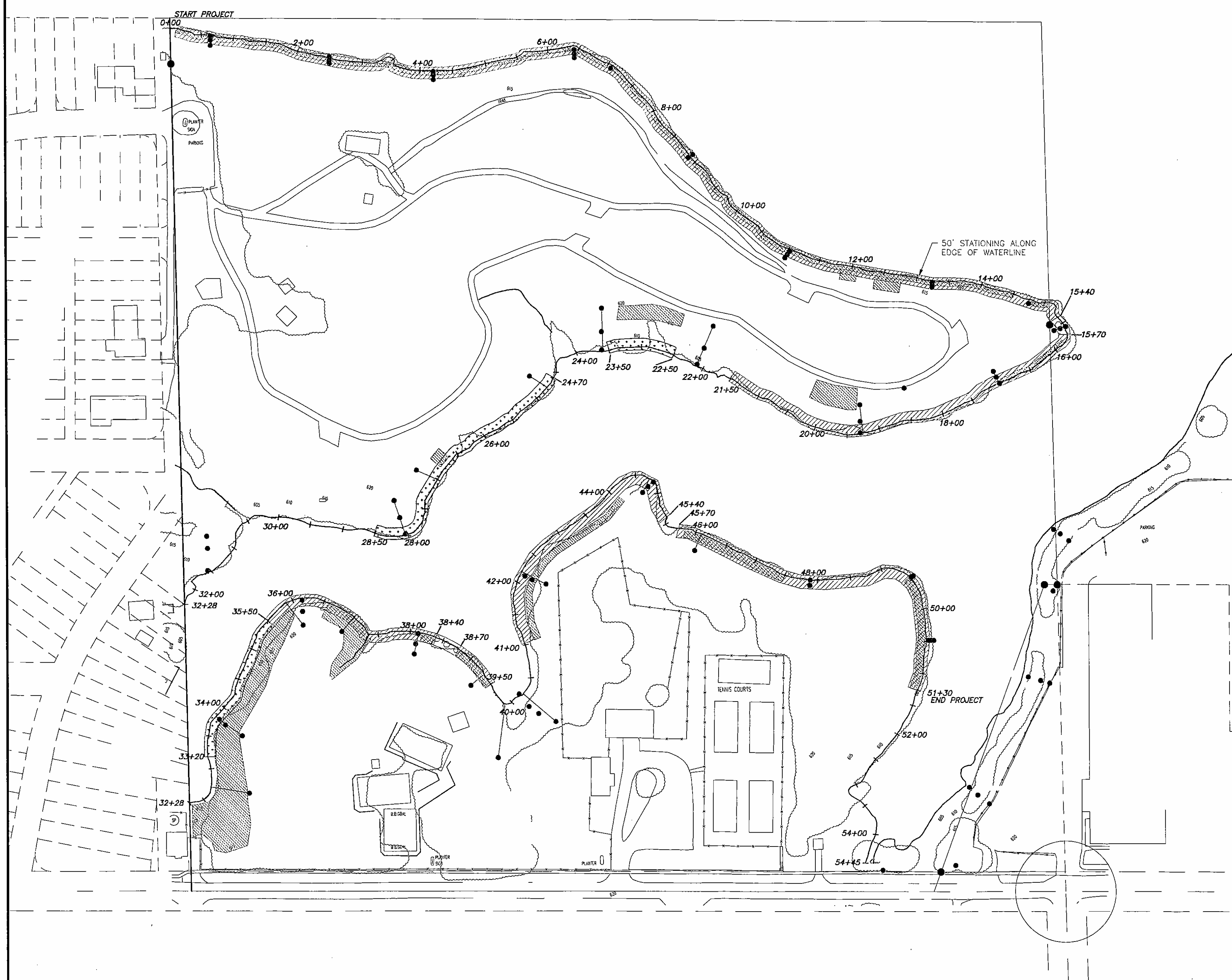

REVISIONS:

	12/02/2004	TITLE BLOCK CHANGES	SKL
	12/08/2004	CORRECTIONS AS PER JBR	JAE

N

0 80'

SCALE IN FEET

SCALE VERIFICATION
This bar measures 1" on 22"x34" or 1/2" on 11"x17" original. Adjust scale accordingly.

NOTES:

1) Sensitive natural areas between Station 0+00 and 17+00 extend 5 feet landward from the top of cut bank. Sensitive natural areas between Station 38+10 and 51+30 extend 10 feet landward from top of cut bank.

2) All areas disturbed during construction of the shoreline stabilization shall be restored to their previous condition as per special provisions.

3) Survey completed by Rowland and Associates, Inc., Angola, Indiana.

LEGEND

- Approximate Shore Line.
- Treatment Type A (See Sheet 5).
- Treatment Type B (See Sheet 6).
- Treatment Type C (See Sheet 7).
- Sensitive Natural Areas- Do Not Disturb. 5' Width from Cut-Bank Unless Otherwise Shown.

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Fred Rose Park Shoreline Stabilization

City of Hobart

Lake County, Indiana

SITE PLAN

DRAWN BY:	JFH
DESIGNED BY:	JR
CHECKED BY:	
DATE:	DEC 2004
JOB NO:	030962
SCALE:	AS NOTED

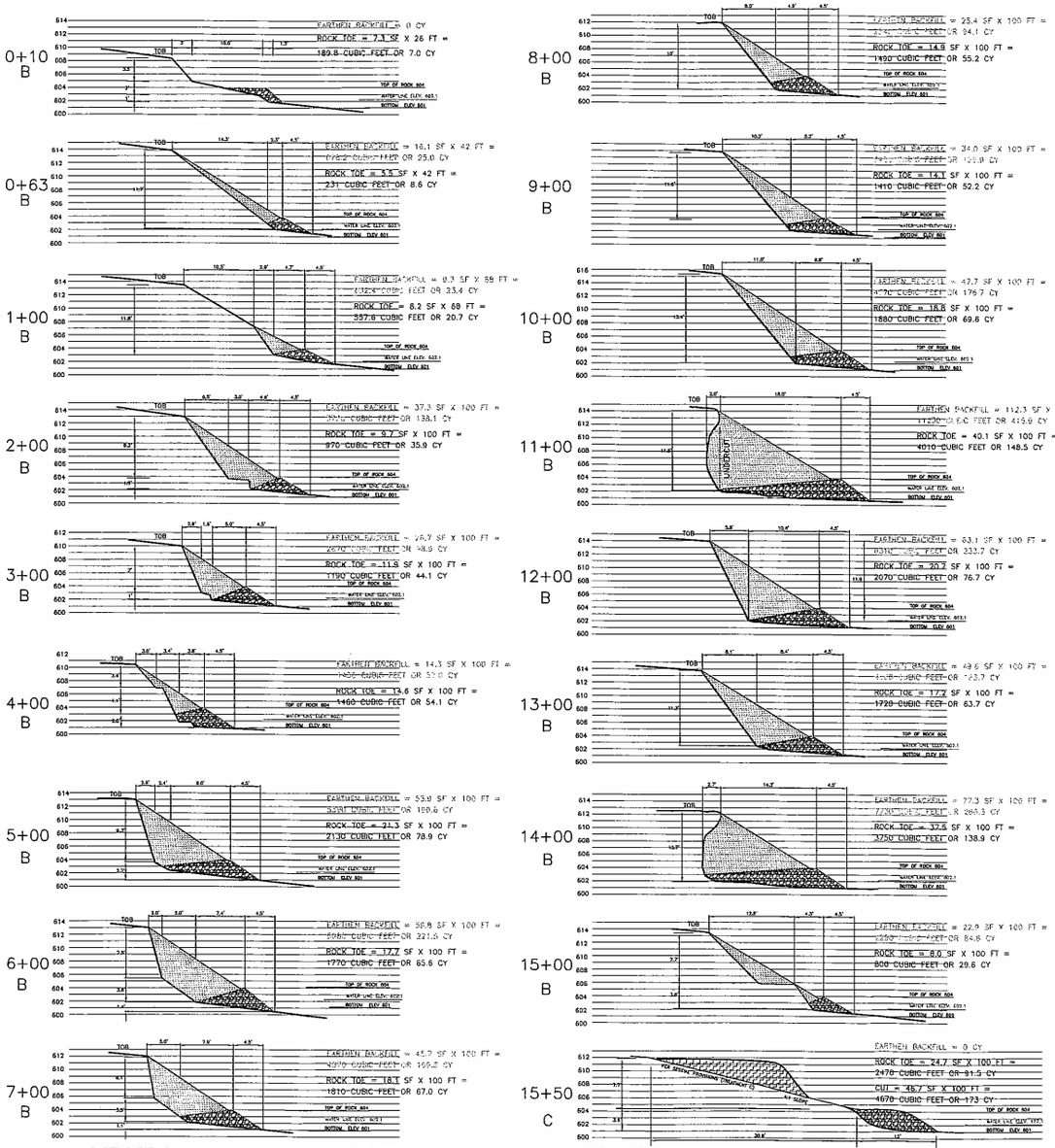
ANDREW L. BENDER REGISTERED No. 10100192 STATE OF INDIANA PROFESSIONAL ENGINEER

02-SITEPLAN.DWG

DRAWING NO.

2

OF 9



SHEET 3 TOTALS	+	SHEET 4 TOTALS	=	OVERALL TOTALS
EARTHEN BACKFILL – TOTAL = 2684.9 CY		EARTHEN BACKFILL – TOTAL = 1129.5 CY		EARTHEN BACKFILL – TOTAL = 3834.4 CY
ROCK TOE – TOTAL = 1381.1 CY		ROCK TOE – TOTAL = 1080 CY		ROCK TOE – TOTAL = 2461.1 CY
CUT – TOTAL = 173 CY		CUT – TOTAL = 0 CY		CUT – TOTAL = 173 CY

HORZ. & VERT.
0 10'
SCALE IN FEET

SCALE VERIFICATION
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City of Hobart
Lake County, Indiana

CROSS SECTIONS (CUT AND FILL CALCS)

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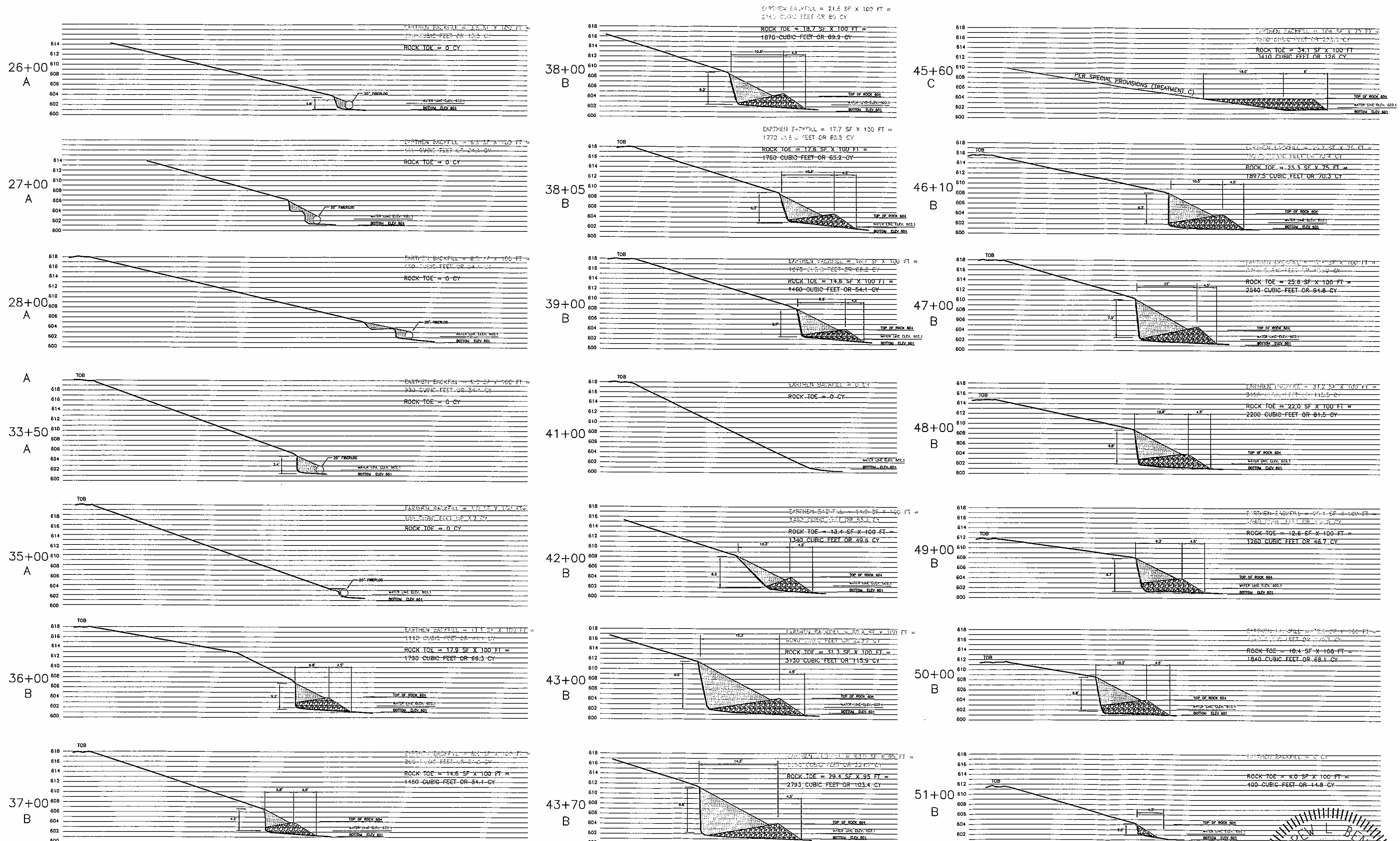
JOB NO:	030962
SCALE:	AS NOTED

03 X-SECTIONS.DWG

DRAWING NO.
3
OF 9

REGISTERED
ANDREW L. RENDER
NO. 10100192
STATE OF INDIANA
PROFESSIONAL ENGINEER

Plotted: - L:\Drawings\Civil\Project Library\030962 Hobart\Final\Plots\03X-SECTIONS.dwg Thu, 2 Dec 2004 - 9:58



SHEET 3 TOTALS

EARTHEN BACKFILL – TOTAL = 2684.9 CY
ROCK TOE' – TOTAL = 1381.1 CY
CUT – TOTAL = 173 CY

\+

SHEET 4 TOTALS

EARTHEN BACKFILL – TOTAL = 1199.5 CY
ROCK TOE – TOTAL = 1080 CY
CUT – TOTAL = 0 CY

=

OVERALL TOTALS

EARTHEN BACKFILL – TOTAL = 3884.4 CY
ROCK TOE – TOTAL = 2461.1CY
CUT – TOTAL = 173 CY

HORZ. & VERT.
0 10'
SCALE IN FEET

SCALE VERIFICATION
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Fred Rose Park Shoreline Stabilization

City of Hobart

Lake County, Indiana

CROSS SECTIONS

DRAWN BY:	JFH
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X-SECTIONS.DWG

ANDREW L. BENDER REGISTERED No. 10100192 STATE OF INDIANA PROFESSIONAL ENGINEER

DRAWING NO.

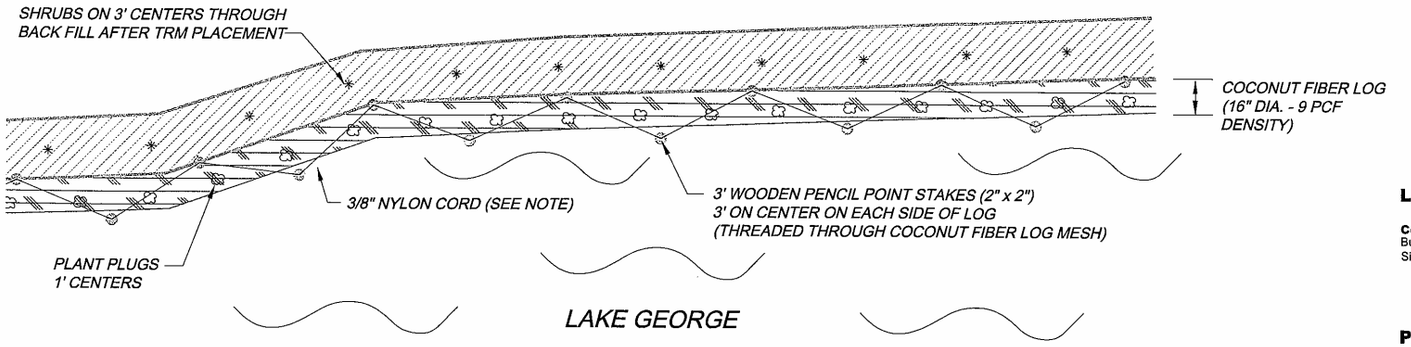
4

OF 9

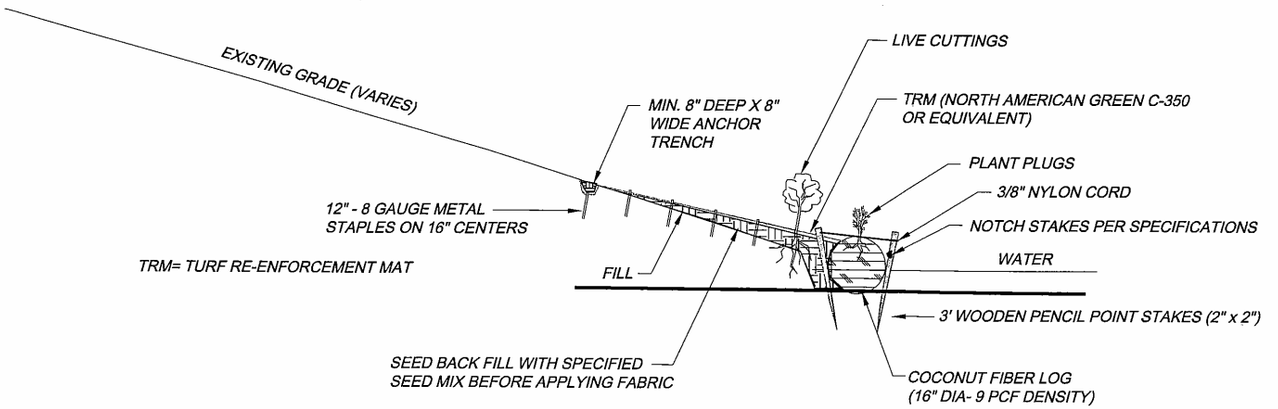
REVISIONS:			
	12/02/2004	TITLE BLOCK CHANGES	SKL
	12/08/2004	CORRECTIONS AS PER JBR	JAE

FRED ROSE PARK

TYPICAL AERIAL VIEW
(TREATMENT LENGTH VARIES)



TYPICAL CROSS SECTION



LIVE STAKES (SEE SPECIFICATIONS)

Common Name:	Scientific Name:
Buttonbush	*Cephalanthus occidentalis*
Silky Dogwood	*Cornus amomum*

PLUGS (SEE SPECIFICATIONS)

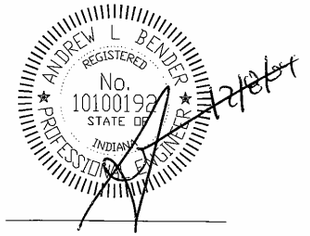
Common Name:	Scientific Name:
Blueflag	*Iris versicolor*
Blueflag Iris	*Iris virginica*
Blue-joint Grass	*Calamogrostis canadensis*
Buttonbush	*Cephalanthus occidentalis*
Cardinal Flower	*Lobelia cardinalis*
Great Blue Lobelia	*Lobelia siphilitica*
Giant Burreed	*Sparganium eurycarpum*
Hibiscus	*Hibiscus laevis*
Hop Sedge	*Carex lupulina*
Prairie Cordgrass	*Spartina pectinate*
River Bulrush	*Scirpus fluviatilis*
Soft-stem Bulrush	*Scirpus validus*
Swamp Dock	*Rumex verticillatus*
Swamp Milkweed	*Asclepias incarnata*
Sweetflag	*Acorus calamus*
Uptight Sedge	*Carex stricta*

NOTES:

1) This treatment to be applied from Station 22+50 to 23+50, Station 24+70 to 28+50, and Station 33+30 to 35+50.

2) See special provisions for installation details.

3) Nylon cord shall be knotted at every fourth stake.



12/8/04

N

0 2'

SCALE IN FEET

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Fred Rose Park Shoreline Stabilization
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TREATMENT A DETAILS

DRAWN BY:	JAE
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DATE:	DEC 2004
JOB NO:	030962
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05-TREATMENT A.DWG

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5

OF 9

REVISIONS:			
	12/02/2004	TITLE BLOCK CHANGES	SKL
	12/08/2004	CORRECTIONS AS PER JBR	JAE

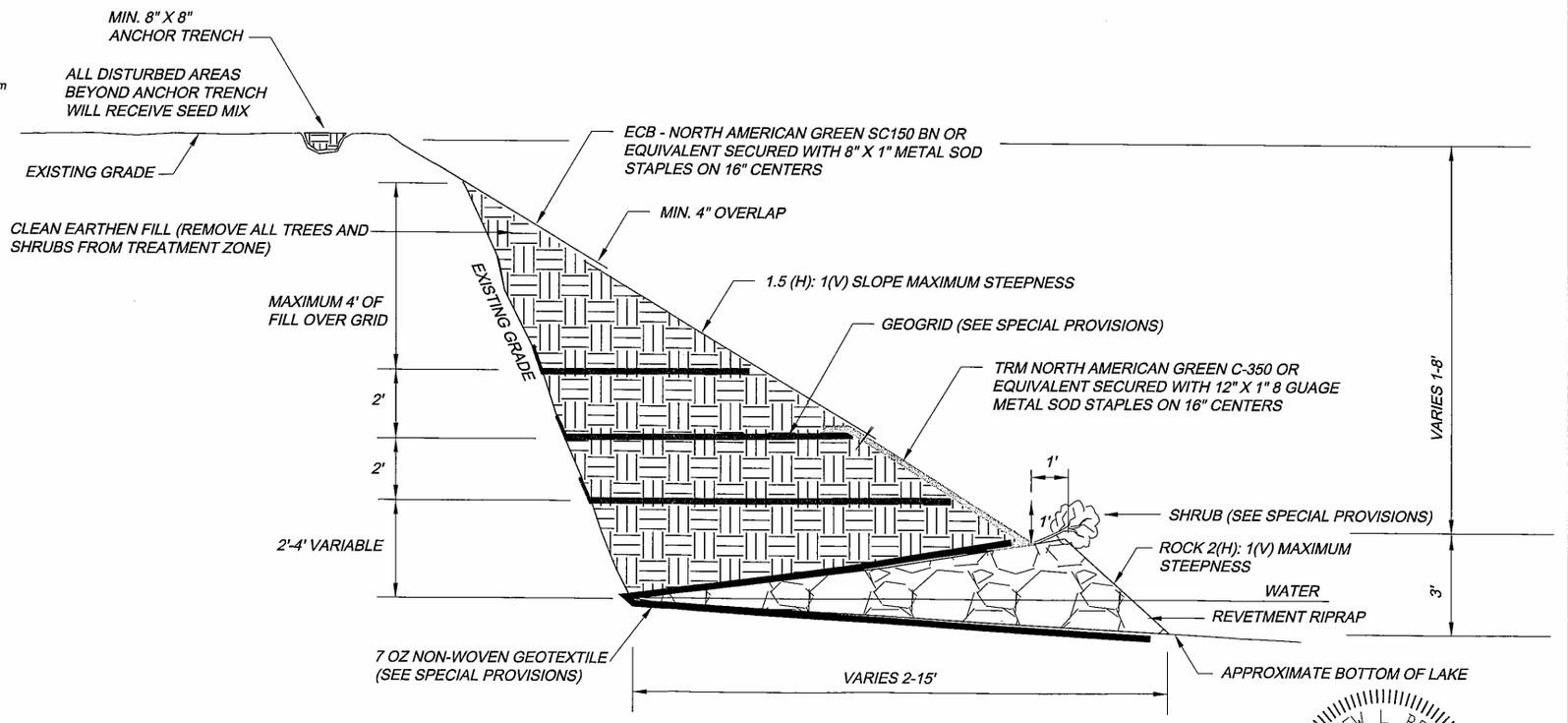
SEED LIST FOR SLOPE (SEE SPECIFICATIONS)

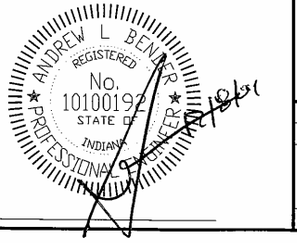
Common Name:	Scientific Name:
Annual Rye	*Lolium multiflorum*
Arrow-leaved Aster	*Aster sagittifolius*
Awl-fruited Oval Sedge	*Carex tribuloides*
Beardtongue	*Penstemon digitalis*
Black-eyed Susan	*Rudbeckia hirta*
Blue Joint Grass	*Calamagrostis canadensis*
Bottlebrush Grass	*Hystrix patula*
Brown-Eyed Susan	*Rudbeckia trilifia*
Brown Fox Sedge	*Carex vulpinoidea*
Butterfly Milkweed	*Asclepias tuberosa*
Canada Wild Rye	*Elymus canadensis*
Common Oak Sedge	*Carex pensylvanica (plugs)*
Common Spiderwort	*Tradescantia ohiensis*
Crested Oval Sedge	*Carex cristatella*
Culver's Rook	*Veronicistrum virginicum*
False Sunflower	*Heliopsis helianthoides*
Golden Alexcinders	*Zizac aurea*
Heath Aster	*Aster ericoides*
Indian Grass	*Sorgastrum nutans*
Little Bluestem	*Andropogon scoparius*
Nodding Fescue	*Festuca obstusa*
Prairie Cord Grass	*Spartina pectinata*
Purple Prairie Clover	*Petalostemum purpureum*
Rosinweed	*Silphium integrifolium*
Rough Blazing Star	*Liatris aspera*
Roundheaded Bush Clover	*Lespedeza capitata*
Seed Oats	*Avena sativa*
Showy Goldenrod	*Solidago speciosa*
Showy Tick-Trefoil	*Desmodium canadense*
Side Oats Grama	*Bouteloua curtipendula*
Smooth Blue Aster	*Aster laevis*
Smooth Beard Tongue	*Penstemon calycrosus*
Switch Grass	*Panicum virgatum*
Thimbleweed	*Anenome virginiana*
Thin Grass	*Agrostis perenncas*
Virginia Rye	*Elymus virginicus*
Wild Bergamot	*Monarda fistulosa*
Wild Columbine	*Aguilegia canedensis*
Wild White Indigo	*Baptisia leucantha*
Wingstem	*Actinomeris allernifolic*
Yellow Coneflower	*Ratibida pinnata*

NOTES:

1) This treatment to be applied from Station 0+00 to 21+50, 35+50 to 38+40, 38+70 to 39+50, 41+00 to 45+40, and 45+70 to 51+30.
2) Rock shall be placed to a minimum height of 3' above the lake bottom at the toe of the slope.
3) Fill shall be compacted in 6" layers to 95% of standard proctor tests.
4) Geogrid shall be placed on every 2' layer of compacted fill until a maximum of 4' of fill remains above grid.
5) TRM = Turf Reinforcement Mat
   ECB = Erosion Control Blanket

TYPICAL CROSS SECTION





N

0 2'

SCALE IN FEET

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JFNew

Fred Rose Park Shoreline Stabilization
City of Hobart
Lake County, Indiana
TREATMENT B DETAILS

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DESIGNED BY:	DL & JR
CHECKED BY:	
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JOB NO:	030962
SCALE:	AS NOTED

06-TREATMENT.DWG

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6

OF 9

REVISIONS:		
08/20/2004	CORRECTIONS AS PER JBR	SJP
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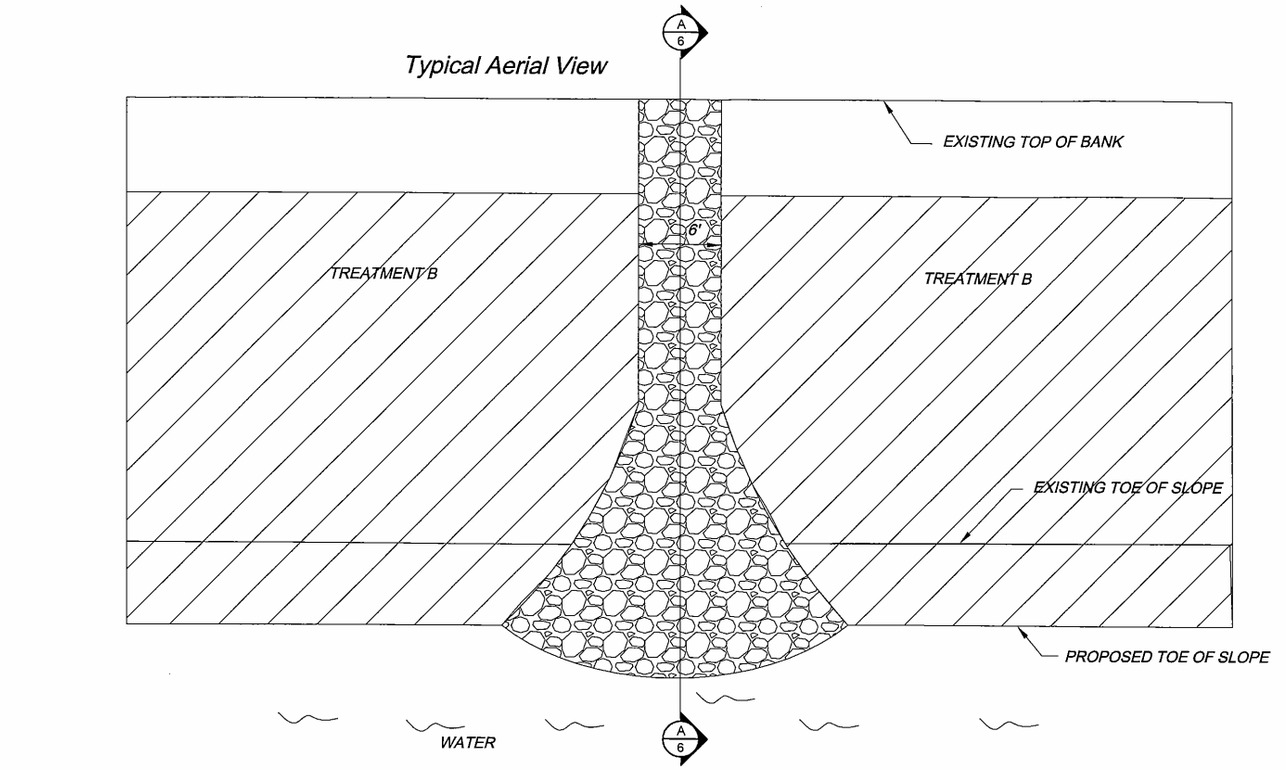
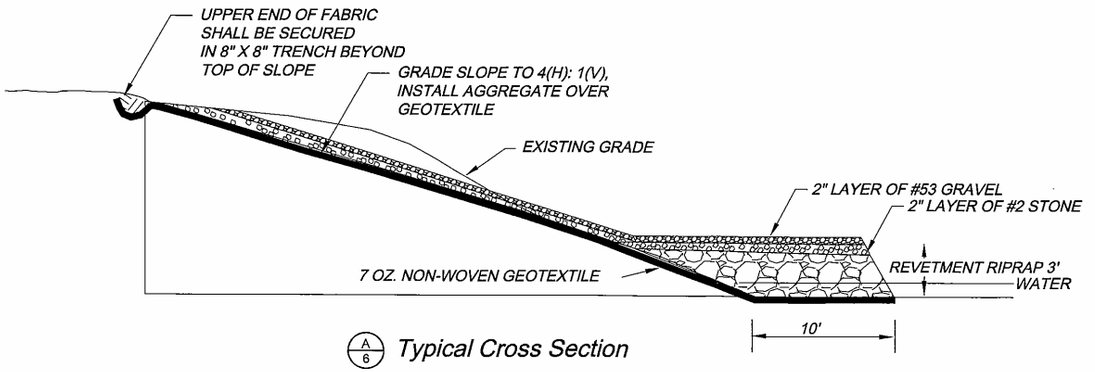
12/08/2004	CORRECTIONS AS PER JBR	JAE

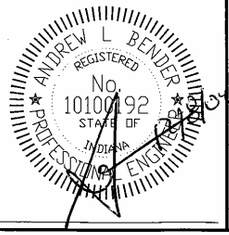




A/6 Typical Cross Section

NOTES:

This treatment to be applied at Stations 15+40 to 15+70 and 38+40 to 38+70.



N

0 5'

SCALE IN FEET

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JFNew

Fred Rose Park Shoreline Stabilization
City of Hobart
Lake County, Indiana

TREATMENT C DETAILS

DRAWN BY:	JAE
DESIGNED BY:	JBR
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DATE:	DEC 2003
JOB NO:	030962
SCALE:	AS NOTED

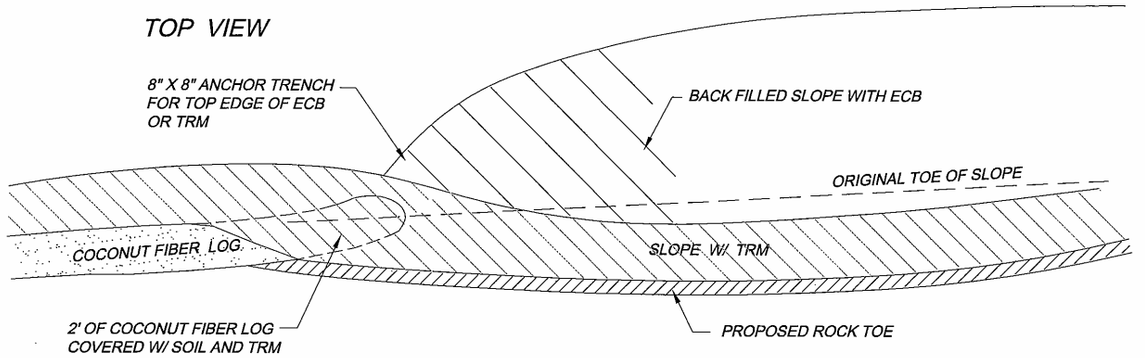
07-TREATMENT C.DWG

DRAWING NO.

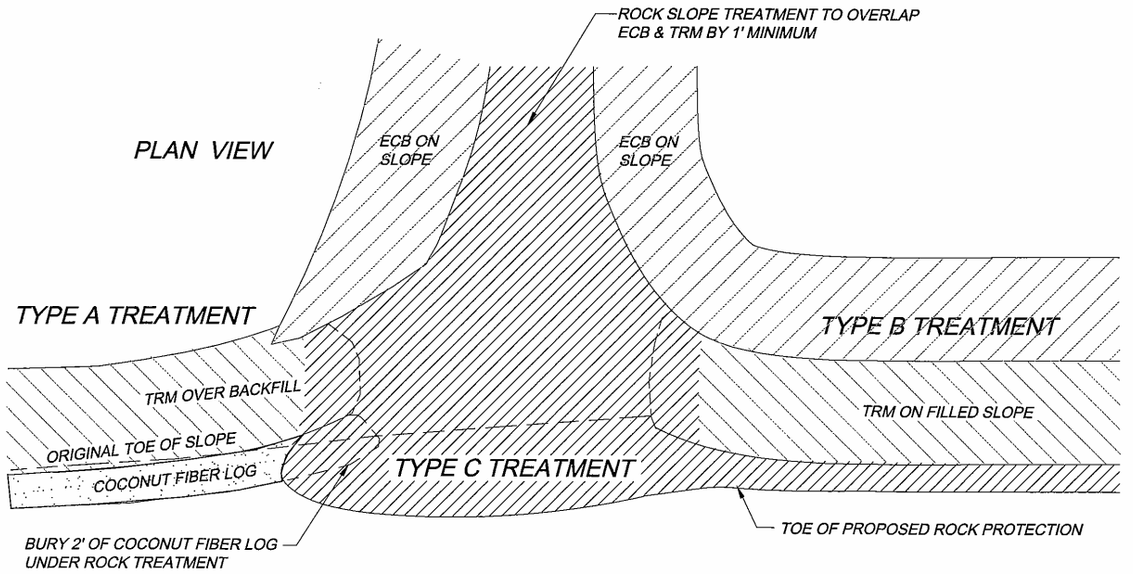
7

OF 9

REVISIONS:			
	12/02/2004	TITLE BLOCK CHANGES	SKL
	12/08/2004	CORRECTIONS AS PER JBR	JAE



JOINING TYPE A TREATMENT TO TYPE B



JOINING TYPE A TREATMENT TO TYPE C & TYPE C TO TYPE B

N

0 5'

SCALE IN FEET

SCALE VERIFICATION
This bar measures 1" on 22"x34" or 1/2" on 11"x17" original. Adjust scale accordingly.

Corporate Office
706 Roosevelt Road
Walkerton, Indiana 46574
574-586-3400 fax 574-586-3445

Cincinnati Office
8000 Beckett Center Dr., Suite 226
West Chester, Ohio 45069
513-843-3446 fax 513-843-3447

Illinois Office
1378 Main Street
Crete, Illinois 60417
708-367-1130 fax 708-367-1132

Indianapolis Office
8540 Parkdale Place, Suite 5
Indianapolis, Indiana 46254
317-388-1662 fax 317-388-1986

Michigan Office
600 South Beacon
Grand Haven, Michigan 49417
616-847-1883 fax 616-847-0070

JFNew

Fred Rose Park Shoreline Stabilization
City of Hobart
Lake County, Indiana

TREATMENT CONNECTION DETAILS

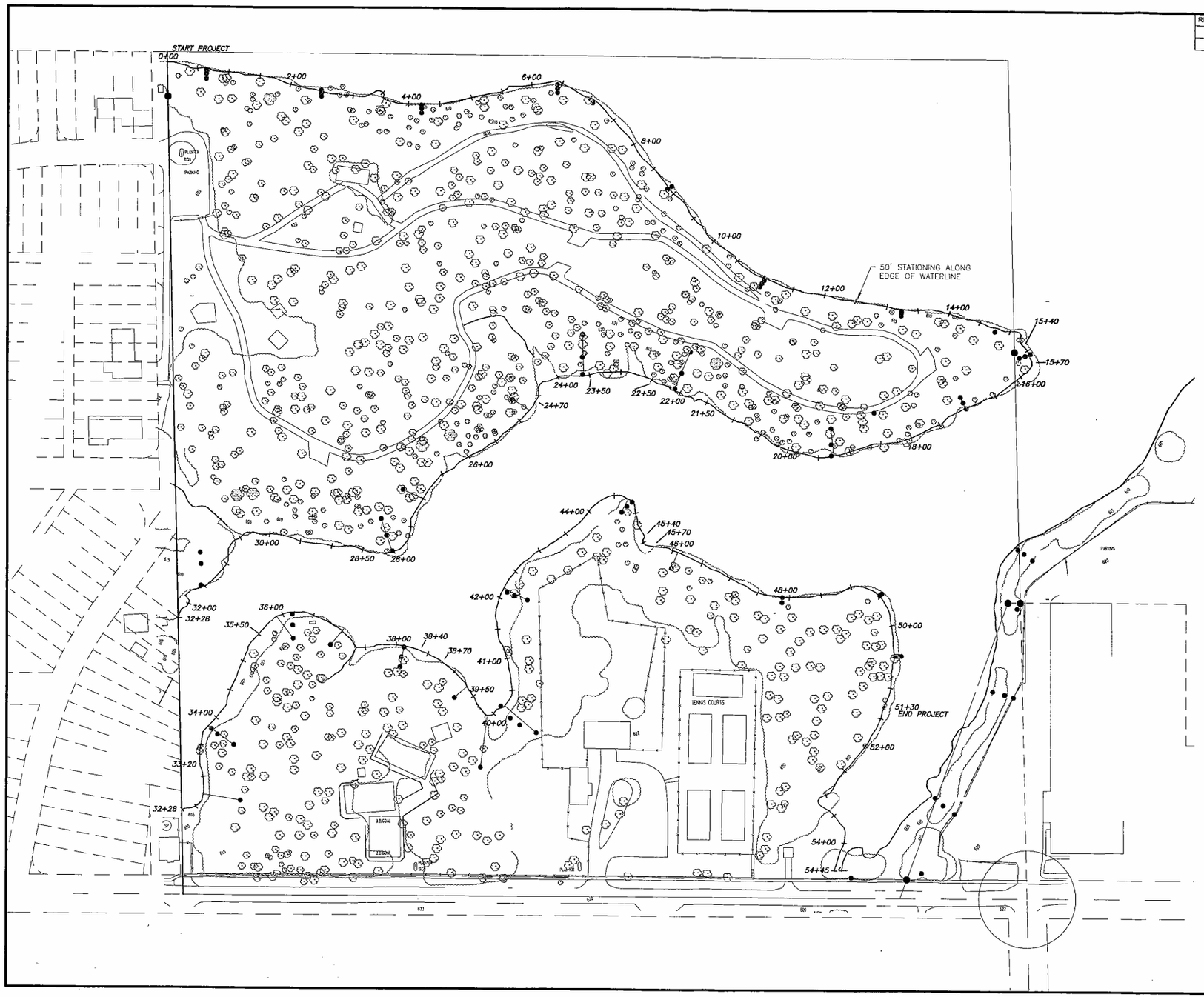
DRAWN BY:	JAE
DESIGNED BY:	DL
CHECKED BY:	
DATE:	DEC 2004
JOB NO:	030962
SCALE:	AS NOTED

08-TREATMENT JOINTS.DWG

DRAWING NO.

8

OF 9



REVISIONS:

	12/02/2004	TITLE BLOCK CHANGES	SKL

LEGEND

——— Approximate Shore Line.

Trees > 6" dbh.

N

0 80'

SCALE IN FEET

SCALE VERIFICATION
This bar measures 1" on 22"x34" or 1/2" on 11"x17" original. Adjust scale accordingly.

Corporate Office
706 Roosevelt Road
Walkerton, Indiana 46574
574-586-3400 fax 574-586-3446

Cincinnati Office
8060 Beckett Center Dr., Suite 228
West Chester, Ohio 45069
513-942-3460 fax 513-942-3447

Illinois Office
1376 Main Street
Crete, Illinois 60417
708-367-1130 fax 708-367-1132

Indianapolis Office
6640 Parkdale Place, Suite S
Indianapolis, Indiana 46254
317-388-1992 fax 317-388-1996

Michigan Office
600 South Beacon
Grand Haven, Michigan 49417
616-847-1660 fax 616-847-0970

JFNew

Fred Rose Park Shoreline Stabilization
City of Hobart
Lake County, Indiana
TREE SURVEY

DRAWN BY:	JFH & JAE
DESIGNED BY:	JR
CHECKED BY:	
DATE:	DEC 2004
JOB NO:	030962
SCALE:	AS NOTED

ANDREW L BENDER
REGISTERED
No. 10100182
STATE OF INDIANA
PROFESSIONAL ENGINEER
12/10/04

09-TREE SURVEY.DWG

DRAWING NO.

9

OF 9

APPENDIX C

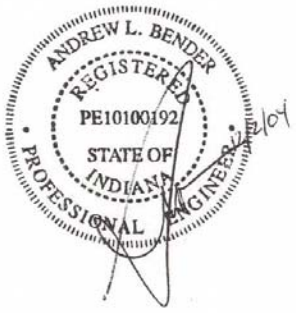
SPECIAL PROVISIONS

FRED ROSE & JERRY PAVESE PARK
SHORELINE STABILIZATION DESIGN REPORT

LAKE COUNTY, INDIANA

SPECIAL PROVISIONS

BANK STABILIZATION
FRED ROSE AND JERRY PAVESE PARKS
HOBART, INDIANA



SPECIFICATIONS

SECTION SS01
GENERAL INFORMATION

PART 1 - WORK COVERED BY CONTRACT DOCUMENTS

The work includes shoreline stabilization work along the Lake George shoreline in Hobart, Lake County, Indiana and all other work as described in these specifications and attached special provisions and shown on the project drawings.

The Contractor shall perform all work required to complete the project in accordance with the contract documents and these specifications.

PART 2 - BID

The Base Bid shall include all work and requirements indicated by the Bid Documents. The Contractor shall not be allowed extra compensation by reason of any matter or thing concerning which the Contractor could have fully informed himself prior to bidding. No verbal agreement, understanding or conversation with an agent or employee of the Owner, either before or after the execution of this contract, unless documented in an official addendum to the bid documents shall affect or modify the terms or obligations herein contained.

PART 3 - REMEDIATION ALLOWANCE

The Contractor shall include an allowance of **$4,000.00** in the base bid for Owner directed remediation of unforeseen constraints or problems along the shoreline.

Such constraints may include but are not necessarily limited to unforeseen subsurface conditions particular to this construction site; improperly recorded or unrecorded physical properties and conditions at the site; obstruction of or delays to reasonable work sequences by the Property, or the Owner, vandalism during or within 30 days of project completion and conflict within or omissions from the Contract Documents.

All remediation work shall be proposed to and authorized by the Owner prior to execution, jointly documented by the Contractor and Owner's Representative, and recorded in Contractor's as-built plans and project record documents.

PART 4 - COMMENCEMENT AND COMPLETION OF WORK

The Contractor shall commence work as directed by the Owner after the date of the Notice to Proceed. All work required by the Contract Documents shall be completed within eight months after the commencement of the work. The project shall be considered open for 30 calendar days following completion of the work to evaluate plant growth.

PART 5 - SUBMISSION OF POST-BID INFORMATION

Submit the following information when requested by the Owner:

1-Designation of the work to be performed by the Contractor with his own forces,

2-List of Subcontractors and their designated work,

3-List of manufacturers and suppliers of specified materials to be used.

4-Designation of the source of borrow material for the project. If the source is anything other than the stockpiled borrow from the Lake George hydraulic dredging disposal basin, the submittal shall include a map (United States Geological Survey topographic map preferred) showing the location. This submittal must be received at least 5 working days prior to any fill material being delivered to the construction site.

PART 6 - WORKING HOURS

The Contractor shall perform all construction activity on Monday thru Friday, excluding state holidays, between the hours of 7:30 a.m. and 5:00 pm, unless previous arrangements are made with the Owner. All work performed at other times shall be only by approval from the Owner, confirmed in writing, and shall not constitute a change in the contract amount.

PART 7 - EXISTING SITE CONDITIONS

Data on the drawings pertaining to present conditions, dimensions, type of construction, obstructions on or near site, location of utilities, etc. have been obtained from sources believed reliable, but accuracy of such data is not guaranteed and is furnished solely for accommodation of the Contractor.

The Contractor shall, prior to excavating, verify the location of all buried utilities, including buried power lines.

PART 8 - CONSTRUCTION AND STORAGE AREA

The Contractor shall confine the construction operations and storage of materials within an area approved by the Owner.

PART 9 - ROADWAY PROTECTION

The Contractor shall, at his expense, be responsible to repair any and all damage to the property's roads and drainage structures caused by his equipment and/or personnel.

PART 10 - ARCHEOLOGICAL AND HISTORICAL ARTIFACTS

If any objects are uncovered during construction that could possibly be of archeological or historical importance, this shall be immediately reported to the Owner. Work at that spot shall not proceed further until the Owner has evaluated the object and the area where it was found and approved continuation of the work.

If any construction time is lost due to such objects being found, an equal number of calendar days will be added to the project completion time given in the specifications.

PART 11 - SALVAGE RIGHTS

Unless stated otherwise in these specifications or on the plans, all equipment and materials removed as part of this project and not being reused shall become the property of the Contractor and removed from the site.

PART 12 - SITE ACCESS PRIOR TO BIDDING

The project site is public property; therefore, bidders may obtain access during daylight hours.

PART 13 - PERMITS

Owner shall obtain all Federal and State permits that relate to the completed project. Contractor shall be responsible for any local construction licenses and shall be required to post and maintain all required permits at the construction site.

PART 14 - SECURITY

Contractor is responsible for the security of his equipment and work.

END OF SECTION

SPECIFICATIONS

SECTION 01050
CONSTRUCTION ENGINEERING

GENERAL INFORMATION

DESCRIPTION

Contractor shall perform all necessary construction engineering, including layout, to ensure the work conforms to the lines, locations, grades, and elevations shown on Contract Documents. The construction engineering shall include establishing all necessary lines, points, etc. with adequate references for the recovery of said items during construction, running a level circuit to establish additional benchmarks for use during construction, setting stakes for structures, slopes, control lines, and grades.

Contractor shall furnish all equipment, personnel, and materials including stakes, templates, levels, and other devices necessary for performing the construction engineering.

QUALITY ASSURANCE

The layout of control points, centerlines, benchmarks, and other items shall be consistent with standard engineering practices. All surveys, not covered by Specifications, required for the layout of the work specified in Contract Documents, shall be of second-order class 1, or better, as defined in "Classification, Standards of Accuracy, and General Specifications of Geodetic Control Surveys" prepared by the Federal Geodetic Control Committee for the U.S. Department of Commerce.

Engineer may check the accuracy of the construction engineering as necessary, but will assume no responsibility for the accuracy of engineering layout or the final result of construction accuracy.

The supervision of Contractor’s construction engineering personnel shall be the responsibility of Contractor and any errors resulting from the operations of such personnel shall be connected at the expense of Contractor and at no additional cost to Owner.

CONSTRUCTION REQUIREMENTS

When staking items, the Contractor shall perform the necessary checking to establish the proper location and grade to fit best the conditions on the site. The Engineer shall approve the location of each structure prior to the installation of items.

END OF SECTION

END OF SECTION

SECTION 01110
SUMMARY OF WORK

GENERAL

DESCRIPTION

The work of this contract consists of the general construction of a landfill leachate treatment system for Tipton County Commissioners. Work includes installing septic tanks, dosing tanks, constructed wetlands, absorption fields, and all related items.

All work will be performed under a single contract. Contractor shall provide and pay for the following:

Labor, materials, and equipment.

Tools, construction equipment, and machinery.

Water, heat, and utilities required for construction.

Other facilities and services necessary for proper execution and completion of project.

LOCATION

The project is located in Tipton County, Indiana. The site is southeast of Tipton, southwest of the intersection of W County Road 300S and S County Road 25E.

CONTRACTOR'S USE OF PREMISES

Contractor shall at all times conduct his operations to ensure the least inconvenience to the public.

Confine storage of materials to area designated by owner. At no time are materials to be stored in the proposed or reserved absorption field areas.

Preservation of Natural Features: confine all operations to work limits of the project. Prevent damage to natural surroundings. Restore damaged areas, repairing or replacing damaged trees and plants, at no additional expense.

Provide temporary barriers to protect existing trees and plants and root zones.

Do not remove, injure, or destroy trees or other plants without prior approval. consult with owner and remove agreed-on-roots and branches that interfere with construction.

Do not fasten ropes, cables, or guys to existing trees.

Carefully supervise excavating, grading, filling, and other construction operations near trees to prevent damage.

Existing Utilities: Notify owner and utility companies of proposed locations and times for excavation.

Contractor shall be responsible for locating and preventing damage to all utilities. If damage occurs, repair utility at no additional expense to owner.

Hauling Restrictions: Comply with all legal load restrictions in the hauling of materials. A special permit will not relieve Contractor of liability for damage that may result from moving of equipment.

CONSTRUCTION MATERIALS

All materials, including borrow and aggregates, shall be furnished by the Contractor.

EARLY OCCUPANCY BY OWNER

Owner and/or Engineer will occupy all areas for the purpose of observation and testing.

Contractor shall provide the following:

Access for Owner's personnel.

Access for Engineer.

Access for all local, state, and federal employees while performing work in their capacity as representative of cognizant authority.

Access for other contractors, if required.

SECURITY

Contractor is responsible for the security of his equipment and work.

PRODUCTS

NOT USED.

EXECUTION

SAFETY STANDARDS

At all times, Contractor shall follow rules and regulations as specified in Occupational Safety & Health Administration (OSHA) Part 1926, "Safety and Health Regulations for Construction."

END OF SECTION

SECTION 01270

DEFINITION OF BID ITEMS

DESCRIPTION

The intent of this section is to explain, in general, what is and what is not included in a bid item, and the limits or cut-off points where one bid item ends and another begins.

If no bid item exists for a portion of the work, include the costs in a related bid item.

BID ITEM NO. 1 – CLEARING AND GRUBBING.

This bid item consists of clearing and grubbing all areas within the construction site.

BID ITEM NO. 2 – SITE GRADING.

This bid item consists of necessary grading, excavation and earthwork associated with structures.

BID ITEM NO. 3 – SITE PIPING.

This bid item consists of trenching, laying and backfilling of all site piping.

BID ITEM NO. 4 – NOT USED

NOT USED.

BID ITEM NO. 5 – DOSING TANKS.

This bid item consists of the installation of all dosing tanks, siphons, and basins at the wetland cells.

BID ITEM NO. 6 – WETLAND CELLS.

This bid item consists of the installation of the three constructed wetland cells.

BID ITEM NO. 7 – PUMPHOUSE.

This bid item consists of the installation of the pumphouse, pumps and controls at the wells.

BID ITEM NO. 8 – WETLAND LEVEL ADJUST SUMPS.

This bid item consists of the installation of the level adjust sump at the wetland cell.

BID ITEM NO. 9 – DISCHARGE STREAM

A. This bid item consists of the installation of a geotextile reinforced riprap channel to the pond.

BID ITEM NO. 10 – EROSION CONTROL.

This bid item consists of erosion control for all areas within the construction site.

BID ITEM NO. 11 – WETLAND PLANTING.

This bid item consists of planting within the wetland cell. This item is not included in this contract.

BID ITEM NO. 12 - ALL OTHER BID ITEMS

As described in the individual sections.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01330
SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work of this section consists of submittal requirements before and during construction.

1.2 SUBMITTAL AND APPROVAL PROCEDURES

A. As specified in the individual sections, forward submittals to Engineer at least 10 days before need for approval. Unless a different number is specified, submit one reproducible original and two copies of each shop drawing, three copies of manufacturer's catalog sheets (cut sheets), three specimens of each sample, and three copies of all other submittals requested.

1. Shop Drawings: Include the following information with each copy of shop drawings:

a. *Date.*

b. *Date of revisions (when applicable).*

c. *Contractor's certification that shop drawing has been checked for compliance with contract documents.*

d. *Details of fabrication, assembly, and erection including connections and engagement to contiguous work.*

e. *Materials used.*

f. *All required dimensions.*

2. Samples: Samples shall be large enough to illustrate clearly the functional characteristics and full range of color, texture, or pattern.

3. Manufacturers' Catalog Sheets: Submit only pertinent pages; mark each copy of standard printed data to identify specific products proposed for use.

4. Manufacturer's Installation Instructions: When contract documents require compliance with manufacturer's printed instructions, provide one complete set of instructions for Engineer and keep another complete set of instructions at the project site until substantial completion.

B. Engineer reserves the right to require submittals in addition to those called for in individual sections.

C. Approved Equals:

1. For each item proposed as an "approved equal," submit supporting data, including:

a. *Drawings and samples as appropriate.*

b. *Comparison of the characteristics of the proposed item with that specified.*

c. *Changes required in other elements of the work because of the substitution.*

d. *Name, address, and telephone number of vendor.*

e. *Manufacturer's literature regarding installation, operation, and maintenance, including schematics for electrical and hydraulic systems, lubrication requirements, and parts lists. Describe availability of maintenance service, and state source of replacement materials.*

2. A request for approval constitutes a representation that Contractor:

a. *Has investigated the proposed item and determined that it is equal or superior in all respects to that specified.*

b. *Will provide the same warranties for the proposed item as for the item specified.*

c. *Has determined that the proposed item is compatible with interfacing items.*

d. *Will coordinate the installation of an approved item and make all changes required in other elements of the work because of the substitution at no additional cost to owner.*

e. *Waives all claims for additional expenses that may be incurred as a result of the substitution.*

D. Coordinate all submittals and review them for legibility, accuracy, completeness, and compliance with contract requirements. Forward submittals that are related to or affect one another as a package to facilitate coordinated review. Each transmittal shall contain only data specific to that individual submittal.

E. Submittal Identification:

1. Engineer will provide a project identification stamp that shall be applied by the Contractor. Identification shall include the project title, contract number, and transmittal number.

2. All sets of shop drawings, manufacturer's catalog sheets, samples, and other documents submitted to the Engineer must have the identification information stamped on the submittal.

3. Identification information shall be applied to the bottom right margin on each page. Identification information on samples shall be applied to the most readily visible area on the sample or on tags attached to sample.

F. Submittal Numbering:

1. Number each submittal consecutively.

2. For re-submittals use the original submittal number, plus a letter suffix beginning with A.

3. Additional re-submittals of the same item shall contain the original number with the next consecutive letter.

G. Engineer's Review:

1. Any work done or orders for materials or services placed before approval shall be at the Contractor's own risk

2. Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.

3. The returned submittal will be marked in one of three ways as defined below:

a. *NO EXCEPTIONS NOTED: Submittal is approved as presented.*

b. *EXCEPTIONS NOTED, FURNISH AS CORRECTED: Minor corrections or clarifications required. All comments are clear and no further review is required. The Contractor shall address all review comments when proceeding with the work.*

c. *EXCEPTION NOTED, REVISE AND RESUBMIT: Substantial corrections or clarifications required. Submittal is partially complete or is acceptable in part. Contractor shall address specific comments, revise and/or clarify and resubmit with changes clearly identified.*

d. *UNACCEPTABLE, RESUBMIT: Rejected as not in accordance with the contract or as requiring major corrections or clarifications. The Engineer will identify the reasons for disapproval. The Contractor shall revise and resubmit with changes clearly identified*

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED

END OF SECTION

SPECIFICATIONS
SECTION 01340
SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

GENERAL INFORMATION

DESCRIPTION

Contractor shall submit to Engineer all shop drawings and samples required by Contract Documents in accordance with this section and the other provisions of Contract Documents.

GENERAL SUBMITTAL REQUIREMENTS

Each submittal must be made to Engineer at least 10 days before the reviewed submittal is needed by Contractor.

Whenever Contractor makes a submittal under this section, he shall compile all material for the submittal into sets by stapling, punching or binding.

Contractor may not use high lighter type markers when making notes on submittals. Any handwritten notes must be made with a pen that reproduces when the document is copied.

Copies may be opaque diazo prints, blueprints, or when applicable, photocopies. Acceptable reproducibles are of vellum, sepia, or mylar. Reproducibles shall be of such quality that crisp, legible copies can be produced.

Each shop drawing or sample submittal shall be accompanied by appropriate product data.

SHOP DRAWING SUBMITTALS

Shop drawing submittals shall be made as required by Drawings and Specifications.

Shop drawings of various components of systems that relate to each other shall be submitted at the same time for proper review. For example, shop drawings of a pump, motor and speed control shall be submitted at the same time.

Each shop drawing submittal shall include three copies of the shop drawing and shall:

Be prepared by a qualified detailer.

Identify details by reference to sheet and detail numbers shown on Drawings and/or the section number of Specifications.

Show the original drawing date and revision dates.

Show the project name, location of site, and project number.

Provide the names of Engineer, Contractor, subcontractor, supplier, manufacturer, and, if pertinent, separate detailer.

Show its relation to adjacent structure or materials.

Show field dimensions, clearly identified as such.

Identify applicable Specification section or Drawing sheet number.

Identify applicable standards, such as ASTM number or federal specification.

Provide a blank four by four inch space for Engineer’s stamp.

SAMPLE SUBMITTALS

Sample submittals shall be made as required by Drawings and Specifications.

Each sample shall be labeled with tags provided by Engineer. Small items or several items for one sample submittal may be submitted in a sturdy envelope or plastic bag. The tags shall:

Show the project name, location of site and project number.

Provide the names of Engineer, Contractor, subcontractor, supplier, and manufacturer.

Identify the applicable specification section or drawing sheet number.

Identify the applicable standards such as ASTM number or federal specification.

Provide space for Engineer's stamp.

CONTRACTOR'S RESPONSIBILITY

Where shop drawings prepared by one specific trade require cross-checking with the shop drawings of some other trade or trades, Contractor shall assemble the shop drawings of all interdependent trades, cross-check and coordinate them himself, require corrections as necessary from the various trades, and then present the corrected drawings in the submission. As an alternate to this procedure, Contractor may make composite drawings showing the interrelation of the concerned trades and subsequent shop drawings of these trades shall be required to conform to these reviewed composite drawings. Fragmentary or piecemeal transmittals of shop drawings for individual trades in violation of this requirement will be returned to Contractor unchecked and will not be accepted.

Contractor shall distribute copies of the submittals subsequent to Engineer's review

Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.

RE-SUBMISSION REQUIREMENTS

Shop Drawings

Contractor is not required to resubmit shop drawings that are marked "No Exception Noted" or "Exceptions Noted, Furnish As Corrected" by Engineer. Shop drawings that are returned to Contractor marked "Exception Noted, Revise And Resubmit," "Unacceptable, Resubmit" are to be resubmitted. Contractor shall submit new copies, not the ones that were marked up by Engineer.

Contractor shall indicate on the shop drawings any changes, including those requested by Engineer, by an identifying symbol, initial and date.

Contractor shall submit new data and samples as required for the initial submittal.

Each submittal, regardless of the action taken, will count as one submittal.

ADDITIONAL SUBMITTALS

Contractor shall attempt to make complete submittals. However, if it is necessary to submit additional material for a shop drawing where review has not yet been completed by Engineer, another CST form shall be completed with the same reference number as the original submittal and shall be clearly marked "Additional Information."

REVISED SUBMITTALS

If Contractor wishes to submit revisions after the shop drawing has been reviewed and returned, the revised shop drawing shall be submitted with the same description as on the previous submittal and noting which portions/pages of the submittal have been revised.

VOIDED SUBMITTALS

If Contractor voids a submittal, he shall notify Engineer in writing that the submittal has been voided. In addition, if the voided submittal has been replaced by another submittal, Contractor shall state the PDE reference number of that submittal.

ENGINEER'S DUTIES

Engineer shall affix stamp and initials or signature indicating the review of the submittal.

Disposition by Engineer shall be "No Exception Noted", "Exceptions Noted, Furnish As Corrected", "Exception Noted, Revise And Resubmit," or "Unacceptable, Resubmit."

Engineer will return two copies of the reviewed submittals to Contractor for distribution. If additional copies are needed by Contractor, then Contractor shall so request in writing and increase the number of submittal copies to Engineer over the three specified, by the number of additional copies needed.

If Engineer requires additional information from Contractor before he can complete the review of and take action on a submittal, Engineer will request that information (including justification for delaying return of shop drawing and/or request for additional information from the contractor form). This interrupts the submittal review time until the required additional information is provided to Engineer.

All submittals may be reviewed twice, if necessary. After a submittal has been reviewed the second time, additional review not caused by the fault of Owner or Engineer may cause extra engineering costs to be billed to Owner, who may pass on such costs to Contractor.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED

END OF SECTION

SPECIFICATIONS
SECTION 01341
MANUFACTURER'S RECOMMENDATIONS

DESCRIPTION
GENERAL INFORMATION

Whenever and wherever Contract Documents indicate the performance of a particular task shall be done in accordance with the manufacturer's recommendations and/or specifications or manufacturer's printed instructions, said recommendations and/or specifications shall be submitted in conformance with Specifications.

CONTRACTOR'S RESPONSIBILITIES

Contractor is responsible for reviewing and approving the specific manufacturer's recommendations and/or specifications and submitting same for Engineer's review per Submittals and/or Shop Drawings.

In the event Contractor wishes to use a manufacturer that has no specific recommendations and/or specifications for a particular application, Contractor shall be responsible for developing such a set of criteria based upon standard practice within the industry. This development shall be limited to points of procedure and cannot be extended to cover specific technical information relating to a particular manufacturer's product. Once these criteria are developed, Contractor shall submit them to the Engineer for his review per 01330 or 01340. This submittal shall clearly differentiate between those elements developed by Contractor and those developed by the specific manufacturer.

Should Contractor be unable to develop the appropriate recommendations and/or specifications, he will be required to substitute a different product which already has the appropriate recommendations and/or specifications or which facilitates their development in accordance with 01330 Sec 1.2.C Approved Equals. All shop drawings, product data and information will be required per 01340.

Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Engineer's review of submittals. Contractor may submit specific deviations to Engineer for review, but such deviations will require the manufacturer's and/or supplier's

written approval for the specific deviation as a prerequisite to Engineer's consideration or approval.

Contractor's shall notify Engineer, in writing at the time of submission, of deviations in submittals from requirements of Contract Documents.

Contractor shall not begin work that requires submittals until return of the submittals.

ENGINEER'S DUTIES

Engineer shall attempt to review submittals within 5 days from receipt of submission. Contractor will be notified if additional time is required.

Engineer's review is only for conformance with the design concept of the project and compliance with the information given in Contract Documents. Contractor is responsible for information that pertains solely to fabrication processes and to techniques for construction.

Engineer shall return the submittals to Contractor for distribution per 01330 or 01340.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED

END OF SECTION

SPECIFICATIONS
SECTION 01510
TEMPORARY SERVICES

GENERAL

DESCRIPTION

The work of this section consists of providing temporary services required for Contractor's performance of the work on this contract.

PRODUCTS

GENERAL

Temporary materials may be new or used, but must be in adequate capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

SANITARY FACILITIES

Provide and maintain temporary toilet facilities in accordance with State Health Department

Sufficiently lighted and ventilated toilet facilities in weatherproof, sight-proof and handicap accessible, sturdy enclosures with privacy locks.

Provide separate facilities for men and women.

FIRE PROTECTION EQUIPMENT

Fire protection equipment sufficient to suppress fires occurring on or around equipment, material, etc. within the contractors responsibility.

Fire extinguishers shall have a minimum UL rating of 2-A: 10-B:C

EXECUTION

ELECTRICITY AND LIGHTING

No electricity is available on site for Contractor's use other than specified on the drawings.

TELEPHONE

No telephone service is available on site for Contractor's use.

WATER

Water for construction is not available within site boundaries. The Contractor shall furnish water from a source outside the site boundary.

Furnish cool, potable water for construction personnel in locations convenient to work stations.

SANITARY FACILITIES

Place in approved locations secluded from public observation and convenient to work stations. Relocate as work progress requires.

Maintain and clean toilet facilities at least weekly.

Completely remove sanitary facilities upon completion of work.

FIRE PREVENTION AND PROTECTION

Responsible Person: A capable and qualified person shall be placed in charge of fire protection. The responsibilities shall include locating and maintaining fire protective equipment and establishing and maintaining safe torch cutting and welding procedures.

Hazard Control: Take all necessary precautions to prevent fire during construction. Do not store flammable or combustible liquids in existing buildings. Provide adequate ventilation during use of volatile or noxious substances.

PROTECTION EQUIPMENT REQUIRED

Vehicles and Equipment: Provide one extinguisher on each vehicle or piece of equipment.

PART 2 - PRODUCTS
Not used.

PART 3 - EXECUTION
Not used.

END OF SECTION

SPECIFICATIONS
SECTION
CLEARING AND GRUBBING

PART 1 - DESCRIPTION

This work shall consist of clearing, grubbing, removing, and disposing of all vegetation and debris within the construction limits of this project except those objects that are designated to remain or are to be removed or salvaged in accordance with other sections of these specifications. This work shall include the prevention of injury to all vegetation or other objects designated to remain.

PART 2 – MATERIALS (none)

PART 3 - CONSTRUCTION REQUIREMENTS

A. The Contractor is responsible for identifying access areas and work area limits within the project boundaries to the satisfaction of the owner. Vegetation not directly impacted by the work shall be preserved by the Contractor unless directed otherwise by the Owner or Owners Representative.

B. Any damage to natural terrain, vegetation, trees, shrubs, plants, or other objects designated to remain shall be repaired or replaced with no additional payment. Tree wound dressing for cut or scarred surfaces of trees or shrubs shall be in accordance with Section 913.09 (c) of Indiana Department of Highways Specifications (1988 or latest edition).

C. Surface objects, trees, stumps, roots, rocks, and other protruding objects not designated to remain shall be cleared and grubbed as needed to complete the contracted work. Generally, clearing will be limited to the eroding face of the embankment and work footprint. Undisturbed stumps, roots, and nonperishable solid objects may be left provided that they are at or below the final grade on slopes and embankments. **Existing fallen trees in Lake George shall be moved lakeward of the area required to reconstruct the embankment or cut up and hauled off-site.** The Contractor shall not be permitted to bury cleared materials on the project site.

D. Burning of debris shall not be permitted on the project site.

E. Perishable materials and debris shall be removed from the project site and disposed of in an approved disposal facility located off the site. Written permission shall be obtained from the property Owner on whose property the materials and debris are to be placed or a receipt obtained from disposal at a sanitary landfill. Materials and debris shall not be disposed of in low-lying areas or wetlands.

END OF SECTION

SPECIFICATIONS
SECTION SS03
ROCK TOE PROTECTION

PART 1 - DESCRIPTION

This Work shall include materials and installation of geotextile filter fabric, riprap, and other stone in accordance with these specifications and the drawings, cross sections, and typical cross sections, unless otherwise directed by the Owners Representative.

PART 2 - MATERIALS

A. Stone type A shall be revetment riprap with an average diameter of 6 inches or greater.

B. Revetment riprap shall comply with all applicable paragraphs of the Indiana Department of Transportation Standard Specifications, latest edition. Riprap shall not include broken concrete, masonry, or other debris removed from old structures or roadways.

C. Filter fabric shall be 7 ounces per square yard non-woven geotextile cloth.

PART 3 - CONSTRUCTION REQUIREMENTS

A. Filter fabric shall be placed on the lake bottom and the excavated shoreline between the soil surface and the rock. The fabric shall be installed parallel to the shoreline and temporarily anchored using wood or metal stakes. The fabric shall cover all exposed soil that, according to the plans, will be covered with rock. Filter fabric shall also be used to form a barrier between the rock and constructed embankment above the rock base. To prevent tearing, rock shall not be dropped onto the fabric from more than three feet. If tears occur the contractor shall cover the tear with another piece of fabric.

B. The revetment riprap shall be placed at locations shown on the plans for Treatment B and Treatment C or as directed by the Owners Representative. It shall be placed to produce a surface of approximate regularity but need not necessarily be hand placed. The riprap will be placed first to form a stable foundation and then be tamped in place with the backhoe or compactor to the grades and elevations shown on the plans. The finished surface shall vary no more than 4 inches from a true plane. Voids shall be reduced to less than five percent of the rock volume. If necessary to eliminate voids, #2 stone can be added.

END OF SECTION

SPECIFICATIONS
SECTION SS04
EMBANKMENT CONSTRUCTION

PART 1 - DESCRIPTION

This work shall include furnishing geogrid materials and installation of soil lifts in accordance with these Specifications and in conformance with the Plans, typical cross sections and specific cross sections for Treatment B, unless otherwise directed by the Owner's Representative.

PART 2 - MATERIALS

A. The geogrid shall be a woven polyester grid with a latex coating. Tensile strength at 5% strain shall be greater than 1200 pounds per square foot in the roll direction of the fabric. The Geogrid shall be Mirafi 5XT or equivalent.

B. Embankment fill shall be clean earthen fill free of roots, rocks and other debris over one (1) inch in diameter. Earthen fill shall consist of a minimum of 20% clay and have no more than 10% organic matter. Earthen fill can be obtained from the City of Hobart, hydraulic dredge spoil basin borrow stockpile.

C. Topsoil shall be clean earthen fill with at least 10% organic matter. Topsoil shall be approved by the Owner's Representative before delivery to the job site. Owner's Representative shall be given notice of the location where topsoil will be obtained a minimum of 5 days prior to delivery to the job site. Contractor shall provide Owner's Representative access to the location where the topsoil will be obtained for inspection and approval.

D. Staples shall be 8 gauge metal staples that are one (1) inch wide by 12 inches long.

PART 3 - CONSTRUCTION REQUIREMENTS

A. The Contractor shall place the non-woven geotextile filter fabric (see Specification SS03) on top of the compacted revetment riprap.

B. The Contractor shall place the specified shrubs (see Specification SS06) over the filter fabric, on ten-foot centers. The root collar shall be placed approximately 12-16 inches from the outside face of the revetment riprap so that the entire root mass will be buried under the constructed embankment. Shrubs shall not be left without earthen cover for more than 15 minutes unless watered.

C. The contractor shall use a temporary form to establish the front face of the soil lift. This form shall be placed over the filter fabric and shrubs so that approximately one-foot of rock shelf remains between the form and the lake. An example form detail is included as part of this specification (see next page).

C. The Contractor shall roll out the Turf Reinforcement Mat (TRM) over the top of the forms and front face of the revetment riprap so that the fabric is upside down and has approximately 2.5 feet of the fabric landward of the form. The fabric shall be stretched to eliminate large wrinkles and creases.

D. The Contractor shall then add earthen fill to a height of 8-12 inches and compact the material into a six-inch lift. Compaction shall be to 95% standard proctor. Repeat six-inch lift fill until the deepest portion of the compacted fill is 2-feet deep.

E. The Contractor shall install the geogrid perpendicular to the slope by cutting the roll across the grain in lengths equal to the top width of the compacted fill. Geogrid shall extend to the existing original grade. The geogrid shall be stretched so that no wrinkles or folds are present. Geogrids shall be stapled into place with metal staples.

F. The Contractor shall repeat step D above by filling an additional 2 feet in compacted six-inch lifts. The contractor shall then add another layer of geogrid to the embankment as in step E.

G. The contractor shall repeat steps D and E until the compacted fill reaches 4 feet in elevation above the front face of the revetment riprap. The Contractor shall then prepare the face of the compacted fill on a 1.5(H):1(V) face for seeding.

H. The contractor shall place 2-4 inches of approved topsoil on all areas to receive seed.

I. The Contractor shall seed the face of the fill material in accordance with Specification SS05.

J. The Contractor shall then install the TRM on the seeded face as per Specification SS07. The top edge of the TRM shall be keyed into the constructed embankment or top of bank such that a minimum of 1-foot of the TRM is beneath final grade.

K. Providing the TRM does not reach the top of bank, the contractor shall continue embankment fill in six-inch lifts installing geogrid every 2-feet in elevation and maintaining the 1.5(H):1(V) slope. The use of geogrid shall be discontinued when the fill is less then 3 feet from the top of bank. When total embankment fill is less than 3 feet, geogrid installation is not necessary.

L. The Contractor shall prepare and seed the embankment slope and install ECB as per Specification SS07, keying the top edge of the ECB into the final grade above or landward of the constructed embankment. All disturbed areas above the constructed embankment shall be seeded with the specified seed mix and ECB installed.

END OF SECTION

SPECIFICATIONS
SECTION SS05
SEED MIXTURE

PART 1 - DESCRIPTION

This work consists of furnishing and applying the specified seed mixture to all areas of reconstructed embankment in accordance with these specifications and the plans. The work also includes adjacent seeding adjacent areas that are disturbed during the construction process.

PART 2 - MATERIALS

The seed mixture shall be acquired from local seed dealers when possible. The contractor shall measure the total area for seeding which shall include all potential disturbed soil areas adjacent to the reconstructed embankments. The following chart lists the composition of Seed Mixture. All substitutions shall be approved by the Design Engineer.

Scientific Name	**Common Name**	**oz/ac**
Temporary Grasses		
Avena sativa	Seed Oats	360
Lolium multiflorum	Annual Rye	100
Permanent Grasses, Rushes, and Sedges		
Andropogon scoparius	Little Bluestem	16
Bouteloua curtipendula	Side Oats Grama	8.0
Calamagrostis canadensis	Blue-joint Grass	8.0
Carex cristatella	Crested Oval Sedge	2.0
Carex pennsylvanica	Common oak sedge	2.0
Carex tribuloides	Awl-fruited Sedge	2.0
Carex vulpinoidea	Brown Fox Sedge	4.0
Elymus canadensis	Canada Wild Rye	8.0
Elymus virginicus	Virginia Wild Rye	8.0
Panicum virgatum	Switchgrass	4.0
Sorghastrum nutans	Indian Grass	8.0
Spartina pectinata	Prairie Cordgrass	8.0
Forbs		
Anenome cylindrical	Thimbleweed	1.5
Asclepias tuberose	Butterfly Weed	1.5
Aster laevis	Smooth Blue Aster	0.75
Aster ericoides	Heath Aster	0.5
Aster sagittifolius	Arrow-leaved Aster	0.75
Baptisia leucantha	Wild White Indigo	1.5
Heliopsis helianthoides	False Sunflower	1.0
Liatris aspera	Rough Blazing Star	2.5

Scientific Name	Common Name	oz/ac
Lespedeza capitata	Roundheaded Bush Clover	2.0
Monarda fistulosa	Wild Bergamot	0.5
Penstemon digitalis	Foxglove Beard Tongue	0.5
Petalostemum purpureum	Purple Prairie Clover	0.5
Ratibida pinnata	Yellow Coneflower	3.0
Rudbeckia hirta	Black-Eyed Susan	1.5
Silphium integrifolium	Rosinweed	3.0
Solidago speciosa	Showy Goldenrod	1.0

PART 3 - CONSTRUCTION REQUIREMENTS

A. SEED PURCHASE, DELIVERY AND STORAGE

All seed shall be Pure Live Seed (PLS) at the amounts specified. A label shall be affixed to each seed lot specifying the PLS content. Seed amounts shall be adjusted to meet 100% PLS. Delivery of seed shall be timed to coordinate closely with the planting time. If the seed needs to be held for more than one day, the Contractor shall store the seed in a cool, dry place until the seed can be applied. Minimize the need to hold seed over from one year to the next. Seed shall be shipped, stored and handled in a manner that will ensure protection from damage and to maintain dormancy until planted.

B. SITE PREPARATION

Soil shall be approved topsoil for a minimum of 2-inches over the compacted fill (See Specification SS04). The soils shall be free of roots, rocks and other debris over 1-inch in diameter. Soil shall be raked before applying seed.

C. PLANTING

Seed shall be sewn by hand or hand operated cyclone seeder. The seeding equipment shall be calibrated to sow the seeds at the rates and proportions as specified in the plans. Seed shall not be covered with more than 1/4 inch of soil.

D. PLANTING TIME

The seeding shall take place between September 15 and June 30. Written permission from the Design Engineer will be required to vary from this planting window.

PART 4 – WARRANTY

At least 75% ground cover shall be achieved at the end of the first growing season. No more than 10% (by areal cover) of the seeded areas will be dominated by perennial weedy species. If these standards are not met, the Contractor shall be responsible for supplemental seeding as approved by the Owner's Representative. Percent ground cover shall be determined by the Owner's representative or trained replacement.

END OF SECTION

SPECIFICATIONS
SECTION SS06
SHRUBS

PART 1 - DESCRIPTION

This work shall consist of furnishing and installing shrubs within Treatment Type A and Treatment Type B in the locations and numbers shown on the plans.

PART 2 - MATERIALS

The following shrubs shall be accepted for the project. All shrubs shall be cuttings, bare root, or potted stock. Shrubs shall be a minimum of 0.25 inches in diameter at the root collar and 12 inches high as measured from the root collar. Cuttings shall be a minimum of 3/4-inch diameter and three-feet long.

Scientific Name	Common Name
Cephalanthus occidentalis	Buttonbush
Cornus amonum	Silky Dogwood

PART 3 - CONSTRUCTION REQUIREMENTS

A. All shrubs shall be purchased the same year they are to be planted. If shrubs need to be held for more than three days, the Contractor shall store them in a cool, moist environment until they can be planted. Shrubs shall be shipped, stored and handled in a manner that will ensure protection from damage. This includes frequent watering to maintain moist roots systems if stored at the job site.

The shrub planting shall take place between September 15 and June 30. Written permission from the Owner's Representative will be required to vary from this planting window.

B. The shrubs shall be installed in Treatment A after installation of the required Turf Reinforcement Mat (TRM) and Erosion Control Blanket (ECB). The shrubs shall be installed by making an " X " shaped cut in the TRM or ECB to excavate the planting hole. The shrubs shall be installed on a minimum spacing of 3 feet. The Contractor shall excavate planting holes to two times the diameter of the root ball and as deep as the root as measured from the root collar down. Roots longer than 12 inches can be pruned with a sharp pruning shears in accordance with INDOT specification 622.07. The seedlings shall be placed into the hole with the roots hanging free and not turned up at the bottom of the hole. The hole shall be backfilled with topsoil and compacted in accordance with INDOT specification 622.08. The Contractor shall than staple the loose TRM or ECB back over the exposed soil using a minimum of four staples in accordance with the Specification for Erosion Control Blankets. The Contractor shall be in accordance with all survival requirements for the seedlings.

C. Shrubs to be installed in Treatment Type B will be installed on top of the filter fabric that overlies the compacted revetment riprap. Shurbs shall be installed on 10-foot centers. The shrubs shall be installed so that the entire root ball up to the collar will be buried under the TRM and subsequent fill for embankment construction (see Specification for Embankment Construction).

PART 4 - WARRANTY

The Contractor shall guarantee at least 75% survival after year one. The shrubs will be monitored by the Owner's Representative one year after planting occurs. The computation of survival percentage shall be based on the number of healthy live shrubs per two 100-foot random sample transects along the planting zones shown on the plans. If the percentage of healthy live shrubs falls below 25 per 100 feet within the planting zones, then the Contractor shall be required to plant additional shrubs to bring the density back to one shrub every three feet at no additional cost to the City.

END OF SECTION

SPECIFICATIONS
SECTION SS07
EROSION CONTROL BLANKETS

PART 1 - DESCRIPTION

This work shall consist of furnishing and installing Erosion Control Blankets (ECB) and Turf Reinforcement Mats (TRM) for all shoreline stabilization treatment types as shown on the engineering plans.

ECB or TRM shall be installed on all embankments having exposed or disturbed soils as shown on the plans. The Contractor shall furnish and install additional ECB on all areas exposed during construction that are not shown on the plans unless otherwise directed by the Owner's Representative. The Contractor shall grade all slopes on the lakeshore as shown on the plans. The Contractor shall prepare all exposed soils for seeding and apply specified seed mixes prior to installing ECB or TRM. The surfaces shall be free of large stumps, roots, rock and other debris greater than one-inch in diameter. The surface of the soil shall be raked smooth in preparation for the seedbed (see Specification SS05). The Contractor shall seed the prepared soil prior to placing the ECB or TRM.

PART 2 - MATERIALS

A. The TRM shall be a permanent turf reinforcement mat of three UV stabilized nets and a coconut fiber matrix having a weight of 0.93 pounds per square yard. Minimum shear stress ratings for the fabric shall be 3.2 pounds per square foot while unvegetated and 8 pounds per square foot when fully vegetated. The TRM shall be installed using 8-gauge metal staples that are approximately 12-inches long by 1-inch wide.

B. The ECB shall be a 70% agricultural straw and 30% coconut fiber blanket with biodegradable netting on both sides. The ECB shall have a weight of approximately 0.5 pounds per square yard. All ECB shall be installed using 8-12 gauge metal staples that are a minimum of 8-inches long by 1-inch wide.

PART 3 - CONSTRUCTION REQUIREMENTS

A. The TRM shall be installed in the locations shown on the plans. Proposed shrubs shall be placed between the TRM and the rock prior to installing the TRM (Specification SS06). The TRM shall be installed above the rock toe-of-slope protection and parallel to the lakeshore. The Contractor shall key the bottom of the TRM into the reconstructed slope by placing the TRM upside down, lakeward of the embankment and constructing the slope on top of 0.75-1.0 feet of the TRM (see Specification for Embankment Construction SS04). Upon completion of the slope the Contractor shall prepare the slope for seeding (Specification SS05) before pulling

the TRM over the slope and stapling to the substrate using a pattern of 3.75 staples per square yard or approximately one staple every 12-inches. The top 0.75-1.0 feet of TRM shall be buried into the reconstructed slope. Any ECB placed above the TRM shall overlap the TRM by 4-6 inches with the overlap stapled every 12 inches along the seam.

B. The ECB shall be installed in the locations shown on the plans. The ECB shall be installed above the elevation of the TRM and parallel with the shoreline using a minimum staple pattern density of 2 staples per square yard or one staple every 18-inches If one ECB is not wide enough to reach the top of bank, then another ECB shall be laid parallel to the first and overlapping the lower ECB by 4-6 inches. The end of each ECB shall overlap the next downstream ECB by a minimum of 12 inches. All overlaps in ECB shall be stapled on a minimum of 12-inch centers. The fabric shall be keyed in at the top of the slope by stapling and burying the upper 12-18 inches of fabric into a trench. The trench shall be a minimum of 8-inches deep and 8-inches wide. The fabric shall line the trench and then be stabled in place before filling the trench with available substrate.

END OF SECTION

SPECIFICATIONS
SECTION SS08
COCONUT FIBER LOG

PART 1 – DESCRIPTION

This work shall consist of furnishing and installing Coconut Fiber Logs (CFL) and associated Turf Reinforcement Mat (TRM) along the Lake George Shoreline, Treatment A, as shown on the engineering plans. The work includes all incidental backfill and other tasks as necessary to secure the CFL to the shoreline.

PART 2 - MATERIALS

A. The Contractor shall furnish and install a pre-planted 16-inch diameter, 9-lb density Coconut Fiber Log (CFL) in 7.5-8.0 foot lengths. The pre-planted CFL shall be grown for a minimum of 3 months in duration prior to field installation. The majority of the roots shall be visible within 2-inches of the CFL bottom. Loose plant plugs or any number of dead plants will be unacceptable. Replacement plant plugs shall be stapled into the CFL with 8-inch metal sod staples. The CFL shall be planted with the following species in plug form on one-foot centers or less:

Scientific Name	**Common Name**
Acorus calamus	Sweetflag
Carex lupulina	Hop Sedge
Carex pellita	Wooly Sedge
Carex stricta	Tussock Sedge
Cephalanthus occidentalis	Buttonbush
Hibiscus laevis	Rosemallow
Iris versicolor	Blueflag Iris
Lobelia cardinalis	Great Blue Lobelia
Lobelia siphilitica	Cardinal Flower
Pontederia cordata	Pickerel Weed
Rumex verticillatus	Swamp Dock
Sparganium eurycarpum	Giant Burreed
Scirpus fluviatilis	River Bulrush
Scirpus validus	Soft-stem Bulrush

B. The Contractor shall furnish and install hardwood stakes that are 2 x 2-inch nominal dimension lumber and 3-feet long with one end sharpened to a pencil point.

C. The Contractor shall furnish and install nylon cord that has a minimum strength rating of 300 pounds.

D. Backfill (Specification SS04)

E. Topsoil (Specification SS04 and SS05)

F. Seed (Specification SS05)

G. Turf Reinforcement Mat (Specification SS07)

H. Metal Sod Staples (Specification SS07)

I. Shrubs (Specification SS06)

PART 3 - CONSTRUCTION REQUIREMENTS

A. Work shall be limited to those areas shown on the engineering plans for Treatment A.

B. Contractor shall install the CFL as close to the existing shoreline as possible, allowing a minimum of 1/3, and a maximum of 2/3 of the CFL to be under water when staked tightly to the substrate, when the water elevation is at 602.1. If necessary, the contractor shall hand excavate a trench in the lake bottom to seat the CFL so that the top elevation of the CFL is 602.9 +/- 0.4.

C. The Contractor shall bind the ends of the CFL tightly together as per the manufacturer's specifications, so that no gaps remain.

D. The Contractor shall secure the CFL into the substrate by driving the 2x2 wood stakes through the mesh encasing the CFL and into the substrate on a 65-75 degree angle so that the bottom of the stake is underneath the CFL. Stakes shall be driven on 3-foot centers along each side of the CFL, offset by 1.5 feet, so that the CFL is wedged tightly between the stakes. The stakes shall be driven so that a minimum of three inches of the stake remains above the CFL.

E. The Contractor shall saw a 1/4-inch wide by 3/4-inch deep notch in the outside of each wooden stake.

F. The Contractor shall secure the end of the nylon cord on the first stake in each complete section of CFL and then, pulling tightly, secure it to the stake on the opposite side of the log by wrapping the nylon cord completely around the wood stake at the notch. The Contractor shall pull the nylon cord tightly between each wood stake back and forth across the CFL until the last stake is reached. The nylon cord shall be secured to the stakes by knotting at every fourth stake.

G. The Contractor shall drive the wood stakes another several inches into the substrate where possible, tightening the nylon cord down over the top of the CFL so that the CFL is unable to be moved. The Contractor shall then trim the wood stakes such that none of the stakes are above the level of the CFL.

H. The contractor shall unroll the TRM upside down over the top of the CFL allowing 2- feet of the fabric to be shoreward of the CFL. The Contractor shall stake the TRM to the substrate (underwater) using 12-inch metal sod staples.

I. The contractor shall backfill between the CFL and the top of the cut slope, burying that portion of the TRM shoreward of the CFL. The backfill shall continue in layers until reaching the elevation of the top of the CFL and the elevation of the adjacent cut bank.

J. The contractor shall then seed the backfill (Specification SS05).

K. The contractor shall then install the TRM over the seeded backfill (Specification SS07). Existing shrubs may be cut off at the elevation of the backfill to facilitate installation or the TRM may be cut to work around the shrubs. All cuts in the TRM shall be securely fastened back to the ground with sod staples on a minimum of 12-inch centers.

L. The Contractor shall install the specified shrubs through the TRM (Specification SS06).

END OF SECTION

APPENDIX D

MONITORING FORMS AND MAINTENANCE INSTRUCTIONS

FRED ROSE & JERRY PAVESE PARK
SHORELINE STABILIZATION DESIGN REPORT

LAKE COUNTY, INDIANA

LAKE GEORGE - SHORELINE STABILIZATION
MAINTENANCE AND MONITORING FORM

Date:
Inspector:
Location Description:

1) Do the areas protected with Turf Reinforcement Mats (TRM) and Erosion Control Blankets (ECB) have a well developed, even coverage of vegetation? If not please note areas of concern.

2) Are there any obvious tears or displaced areas of TRM or ECB? If so, please note approximate locations and size of damaged areas.

3) Are there any areas where water has eroded soil out from underneath the TRM or ECB? If so please note where these areas are and their approximate sizes.

4) If you know your plant species, please look at the attached list of plants and note which ones are present within their planting zones including the coir fiber logs.

5) Does the rock toe at the base of the reconstructed slopes and in the access areas appear to be in good condition? If not, what areas are in need of repair?

6) Are the coir fiber logs securely fastened to the substrate and are the ropes and stakes in good condition? If not, please note areas that need attention.

7) Is there a minimum of one plant per lineal foot growing into or through the coir fiber log? If not please note where these areas are in a sketch on the back of this form.

Please send completed forms with Photographs of problem areas to:

Superintendent of Parks and Recreation
Hobart Parks and Recreation Department
111 E. Old Ridge Road
Hobart, IN 46342

SEED

Permanent Grasses, Rushes, and Sedges	
Andropogon scoparius	Little Bluestem
Bouteloua curtipendula	Side Oats Grama
Calamagrostis canadensis	Blue-joint Grass
Carex cristatella	Crested Oval Sedge
Carex normalis	Spreading Oval Sedge
Carex pelitta	Woolly Sedge
Carex tribuloides	Awl-fruited Sedge
Carex vulpinoidea	Brown Fox Sedge
Elymus canadensis	Canada Wild Rye
Elymus virginicus	Virginia Wild Rye
Panicum virgatum	Switch Grass
Sorghastrum nutans	Indian Grass
Spartina pectinata	Prairie Cordgrass
Forbs	
Anemone virginiana	Thimbleweed
Asclepias tuberosa	Butterfly Weed
Aster laevis	Smooth Blue Aster
Aster ericoides	Heath Aster
Aster sagittifolius	Arrow-leaved Aster
Baptesia leucantha	Wild White Indigo
Heliopsis helianthoides	False Sunflower
Lespedeza capitata	Roundheaded Bush Clover
Liastris aspera	Rough Blazing Star
Monarda fistulosa	Wild Bergamot
Penstemon digitalis	Beardtongue
Petalostemum purpureum	Purple Prairie Clover
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-eyed Susan
Silphium integrifolium	Rosinweed
Solidago speciosa	Showy Goldenrod

PLUGS

Scientific Name	Common Name
Acorus calamus	Sweetflag
Carex lupulina	Hop Sedge
Carex pelitta	Woolly Sedge
Carex stricta	Tussock Sedge
Cephalanthus occidentalis	Buttonbush
Hibiscus laevis	Rose Mallow
Iris versicolor	Blueflag Iris
Lobelia siphilitica	Great Blue Lobelia
Lobelia cardinalis	Cardinal Flower
Pontederia cordata	Pickerel Weed
Rumex verticillatus	Swamp Dock
Scirpus fluviatilis	River Bulrush
Scirpus validus	Soft-stem Bulrush
Sparganium eurycarpum	Giant Burreed
Shrubs	
Amelanchier arborea	Serviceberry
Cephalanthus occidentalis	Buttonbush
Cornus amomum	Silky Dogwood
Viburnum prunifolium	Blackhaw Viburnum